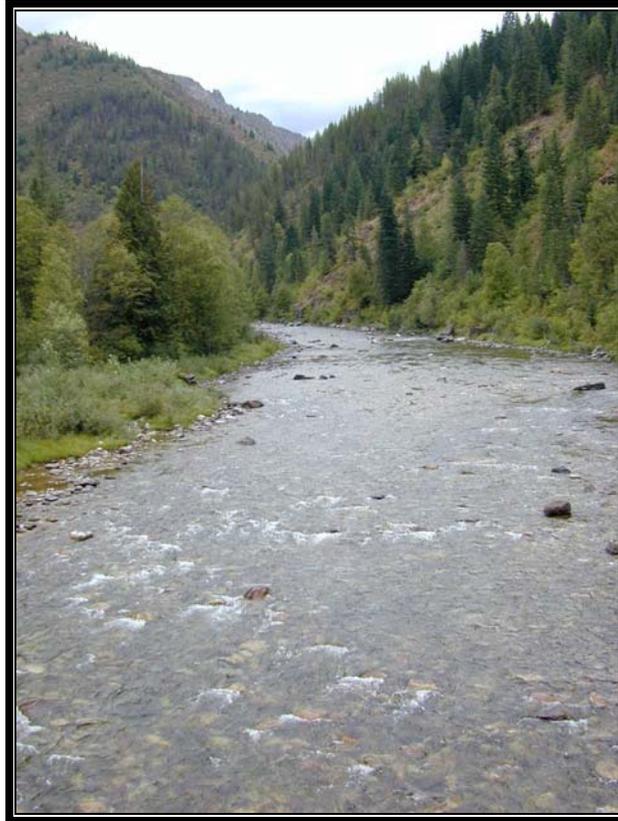


Upper North Fork Clearwater River Subbasin Assessment and Total Maximum Daily Loads



**Department of Environmental Quality
October 2003**

Appendix 1. Assessment Units

Appendix 1. Assessment Units

Assessment Units for the Upper North Fork Clearwater River Subbasin TMDLs

The Upper North Fork Clearwater River Subbasin TMDLs are written for water bodies and water quality listed segment on the 1998 303(d) list. However, the state of Idaho is moving towards a water quality accounting system based on assessment units. One water body may contain one or more assessment units. Table 1-1 shows the assessment units accounted for by the TMDLs in this document and their relation to the 303(d) list.

The assessment unit code contains information that can be used to relate the assessment units to water bodies, hydrologic units, and the state as follows: the ID prefix indicates the state of Idaho, the number 17060307 is the hydrologic unit code for the Upper North Fork Clearwater River Subbasin, CL001 through CL048 are the water bodies in the Upper North Fork Clearwater River Subbasin, and the last numbers identify the assessment unit within the water body.

For the individual assessment unit identifiers, the rationale for the particular numbers and letters are as follows: 02 indicates first and second order streams, 03 indicates third order streams, 04 indicates fourth order streams, 05 indicates fifth order streams, “a” and “b” indicate subdivisions of the water body for any characteristic thought to be important to water quality assessment.

Table 1-1. Assessment units, TMDL water bodies, and 1998 303(d) list water quality limited segments.

Assessment Unit	TMDL Stream Name(s)	TMDL WQLS¹ No(s).	WBID²	Water Body Boundaries	Listed Pollutant	TMDLs Completed	Proposed Delisting
ID17060307 CL001_02a	Sneak Creek	5178	001	North Fork Clearwater River - Skull Creek to Beaver Creek	Channel Stability	Temperature	Channel Stability
ID17060307 CL003_02a	Tumble Creek	5200	003	Washington Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL005_02	Lower Orogrande Creek	3215	005	Orogrande Creek - French Creek to mouth	Sediment	none	Sediment
ID17060307 CL005_02a	Tamarack Creek	5193	005	Orogrande Creek - French Creek to mouth	Sediment	Temperature.	Sediment
ID17060307 CL005_04	Lower Orogrande Creek	3215	005	Orogrande Creek - French Creek to mouth	Sediment	Temperature	Sediment
ID17060307 CL006_02	Upper Orogrande Creek	3215	006	Orogrande Creek - source to French Creek	Sediment	Temperature	Sediment
ID17060307 CL006_03	Upper Orogrande Creek	3215	006	Orogrande Creek - source to French Creek	Sediment	Temperature	Sediment
ID17060307 CL007_02a	Sylvan Creek	5192	007	French Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL007_02b	Hem Creek	5093	007	French Creek - source to mouth	Sediment	none	Sediment
ID17060307 CL012_02	Middle Creek	5123	012	Middle Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL012_02a	Middle Creek	5123	012	Middle Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL012_03	Middle Creek	5123	012	Middle Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL012_03a	Middle Creek	5123	012	Middle Creek - source to mouth	Sediment	Temperature	Sediment

Assessment Unit	TMDL Stream Name(s)	TMDL WQLS¹ No(s).	WBID²	Water Body Boundaries	Listed Pollutant	TMDLs Completed	Proposed Delisting
ID17060307 CL021_02	Gravey Creek	3229	021	Gravey Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL021_02a	Marten Creek	5119	021	Gravey Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL021_02b	Gravey Creek	3229	021	Gravey Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL021_03	Gravey Creek	3229	021	Gravey Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL021_03a	Gravey Creek	3229	021	Gravey Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL030_02	Osier, China, and Laundry Creeks	3225, 5040, 5104	030	Osier Creek - source to mouth	Sediment Temperature	Temperature	Sediment
ID17060307 CL030_02a	Swamp and Sugar Creeks	5189, 5190	030	Osier Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL030_03	Swamp Creek	5190	030	Osier Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL032_02a	Deception Gulch	5059	032	North Fork Clearwater River - Lake Creek to Kelly Creek	Sediment	Sediment Temperature	None
ID17060307 CL040_02	Cold Springs and Cool Creeks	5045, 5047	040	Cold Springs Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL044_02a	Grizzly Creek	5088	044	Quartz Creek - source to mouth	Sediment	Temperature	Sediment
ID17060307 CL045_02	Cougar Creek	5049	045	Cougar Creek - source to mouth	Sediment	Temperature	Sediment

¹ WQLS = water quality limited segment² WBID = water body identification number

Appendix 2. Data Charts

Appendix 2. Data Charts

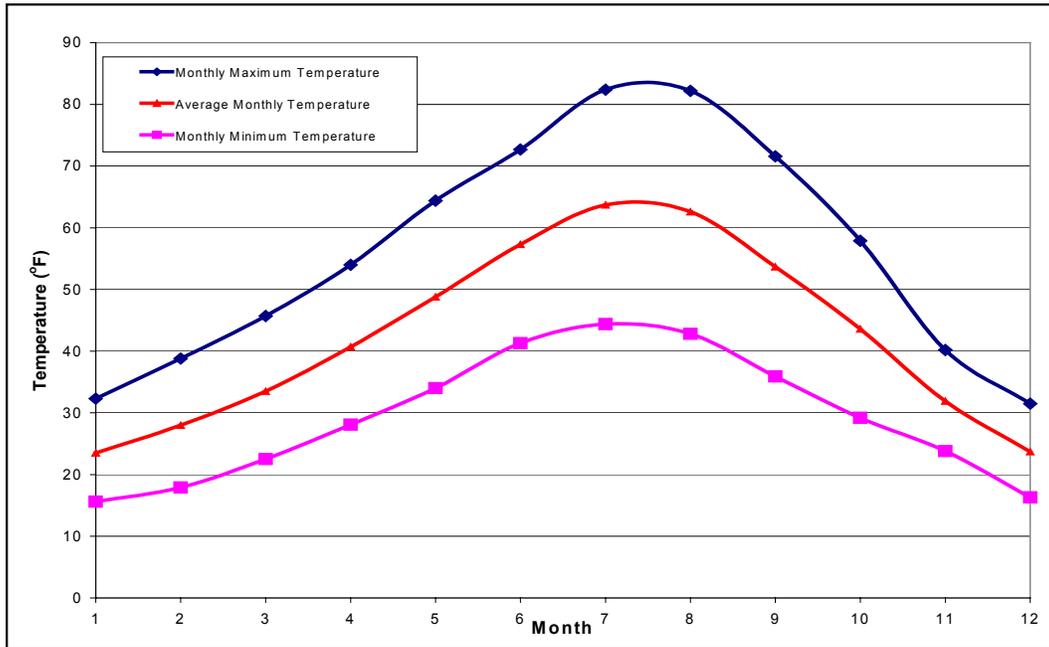


Figure 2-1. Powell Ranger Station National Weather Service 29-Year Mean Monthly Temperatures

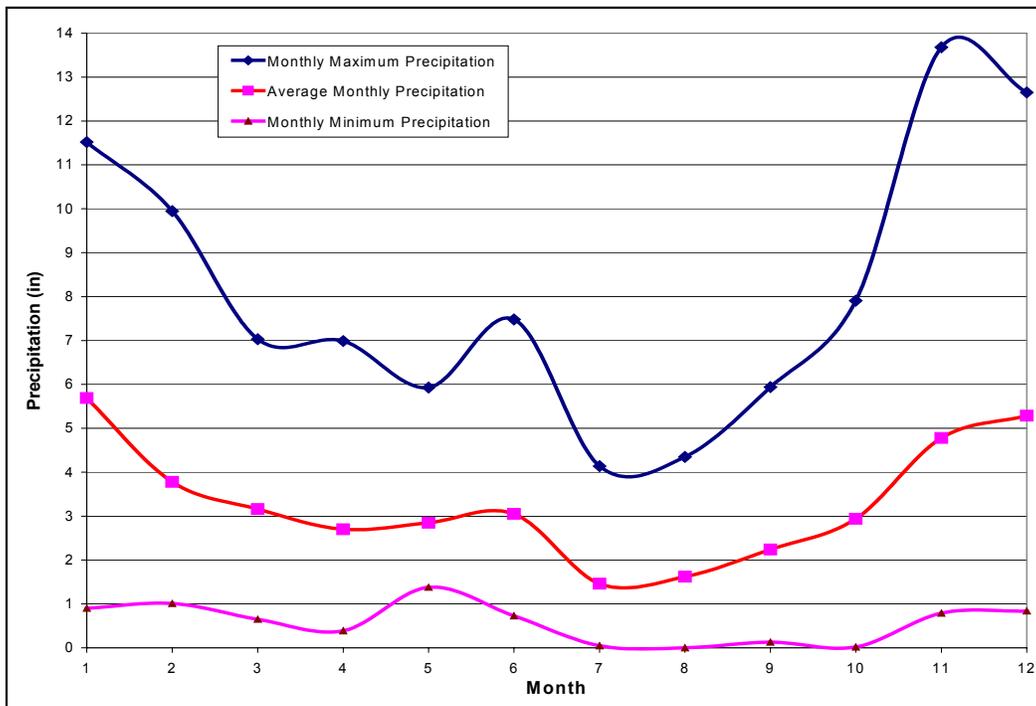


Figure 2-2. Powell Ranger Station National Weather Service 36-Year Mean Monthly Precipitation

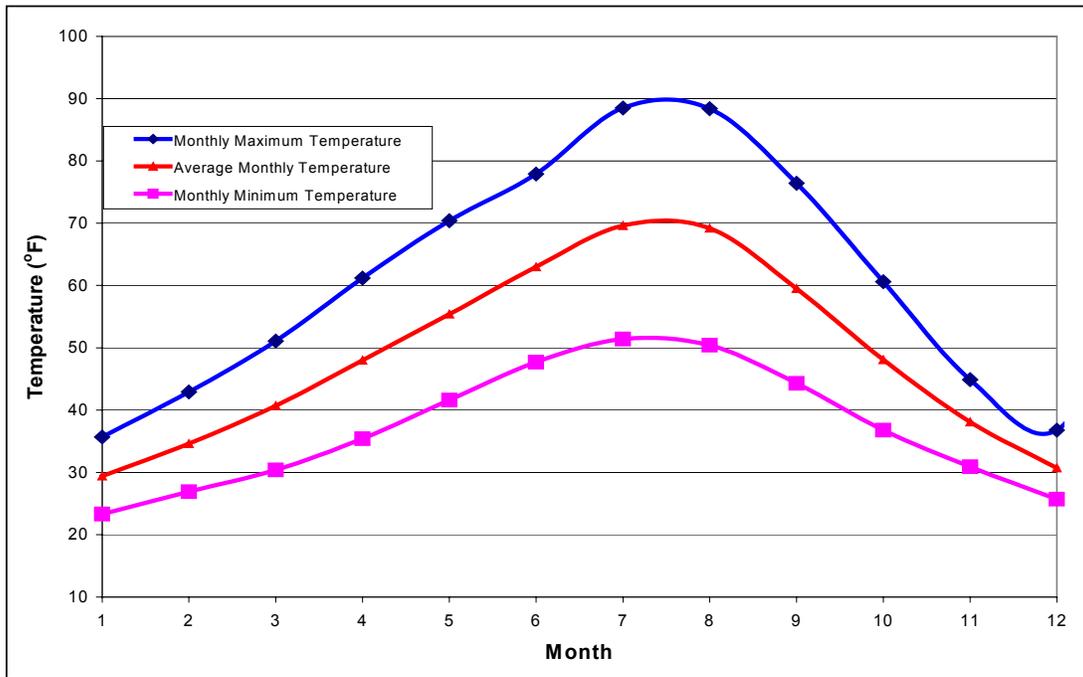


Figure 2-3. Fenn Ranger Station National Weather Service 30-Year Mean Monthly Temperatures

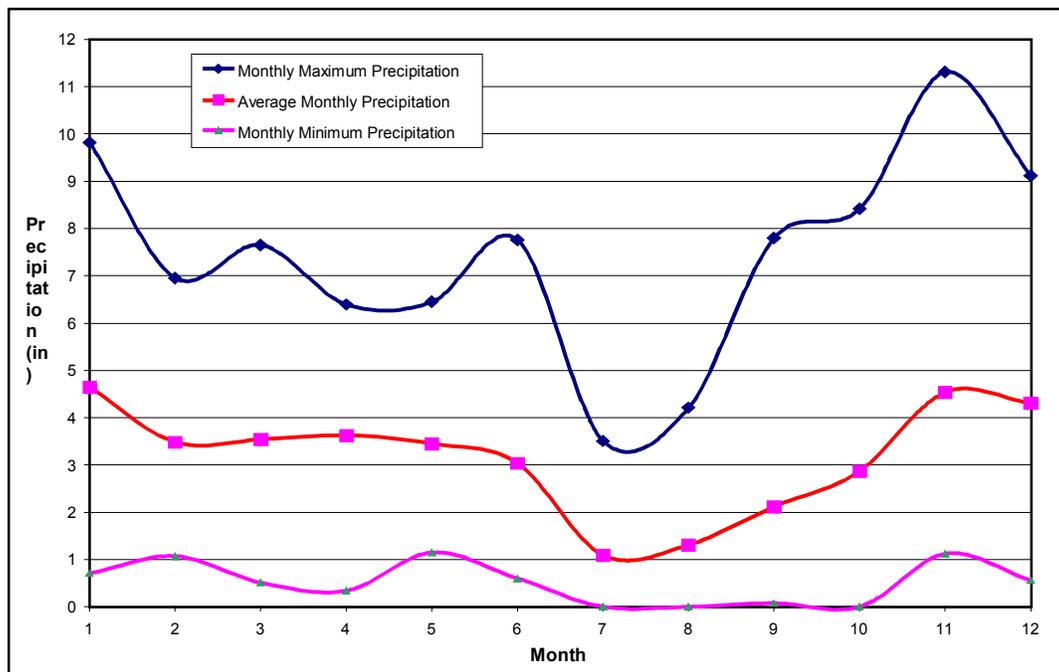


Figure 2-4. Fenn Ranger Station National Weather Service 47-Year Mean Monthly Precipitation

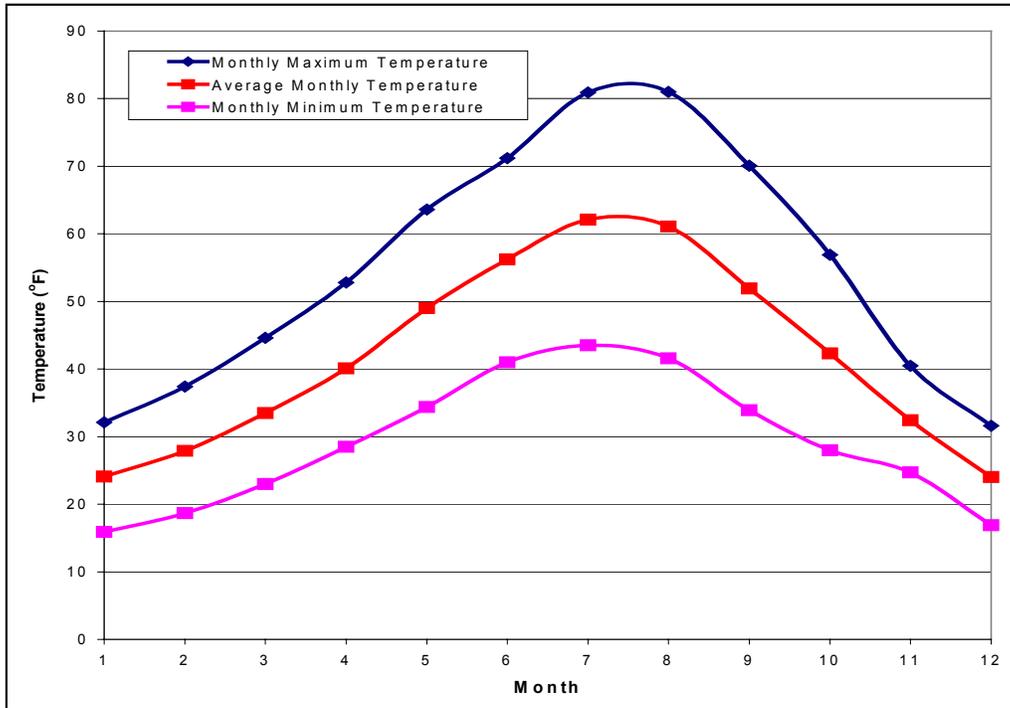


Figure 2-5. Pierce Ranger Station National Weather Service 28-Year Mean Monthly Temperature

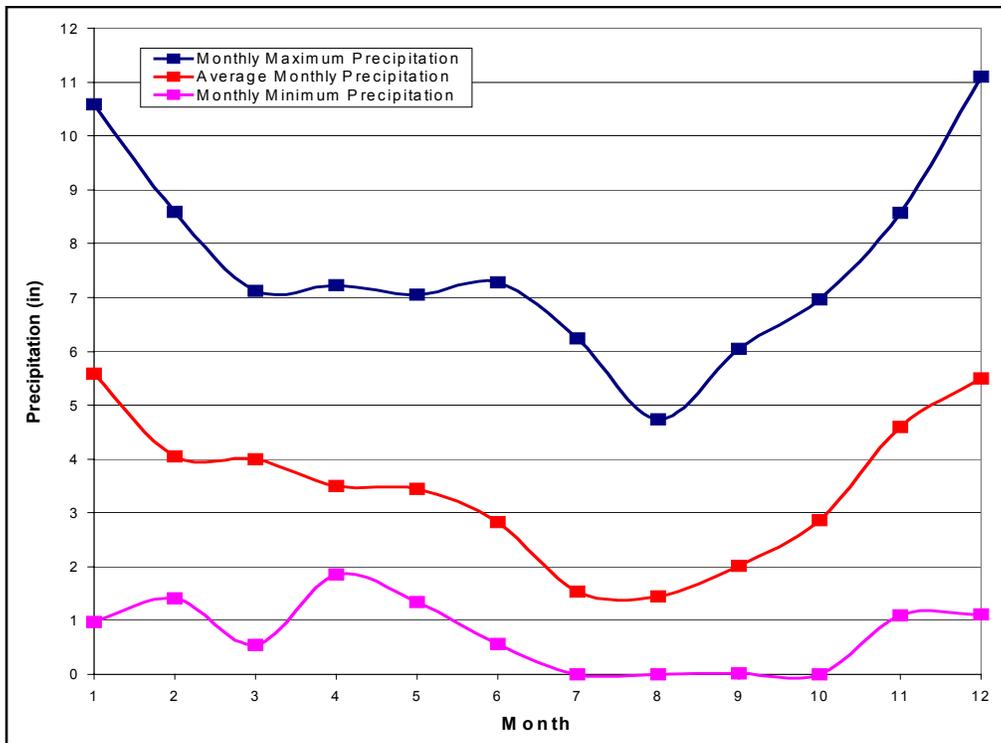


Figure 2-6. Pierce Ranger Station National Weather Service 23-Year Mean Monthly Precipitation

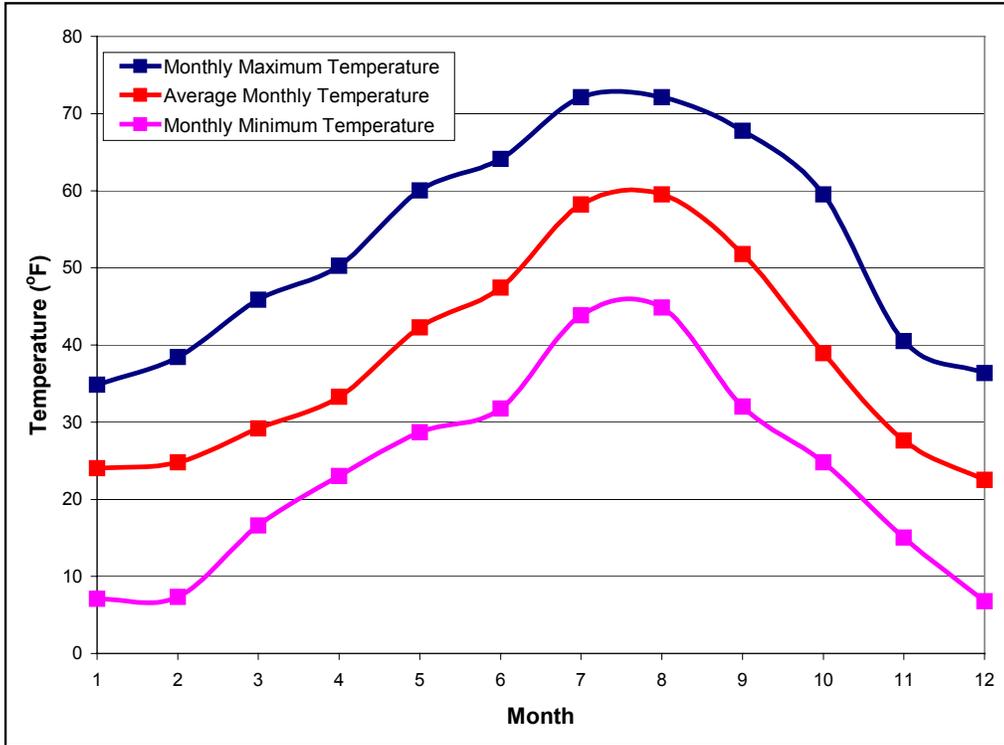


Figure 2-7. Hemlock Butte SNOTEL Station 7-Year Mean Monthly Temperature

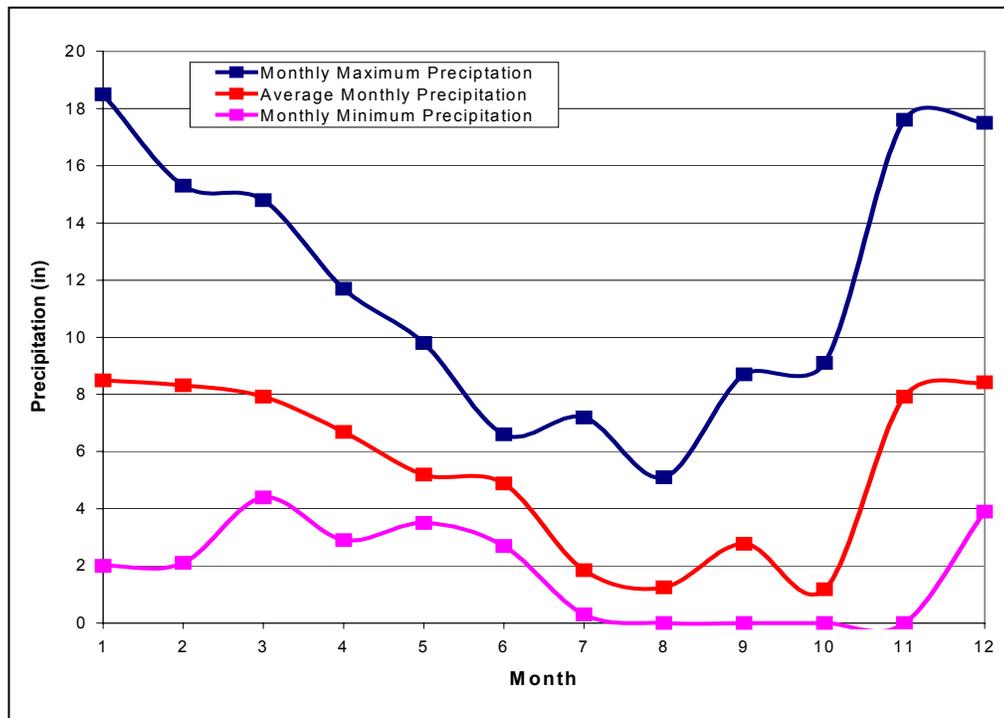


Figure 2-8. Hemlock Butte SNOTEL Station 16-Year Mean Monthly Precipitation

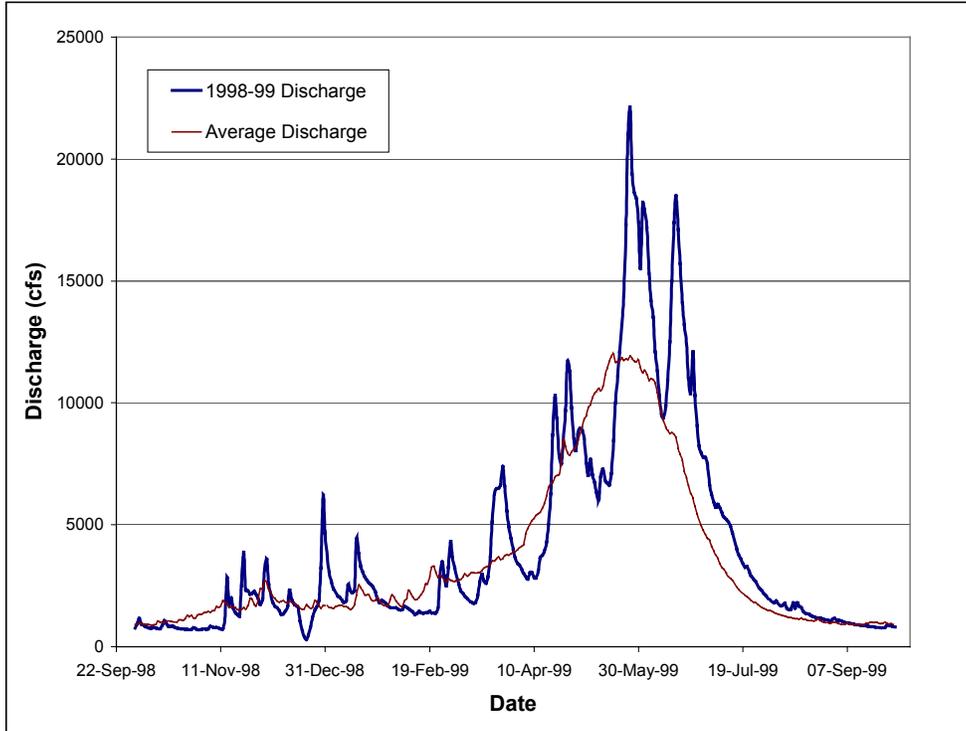


Figure 2-9. Discharge for 1998-99 and Average Discharge for the North Fork Clearwater River Near Canyon Ranger Station

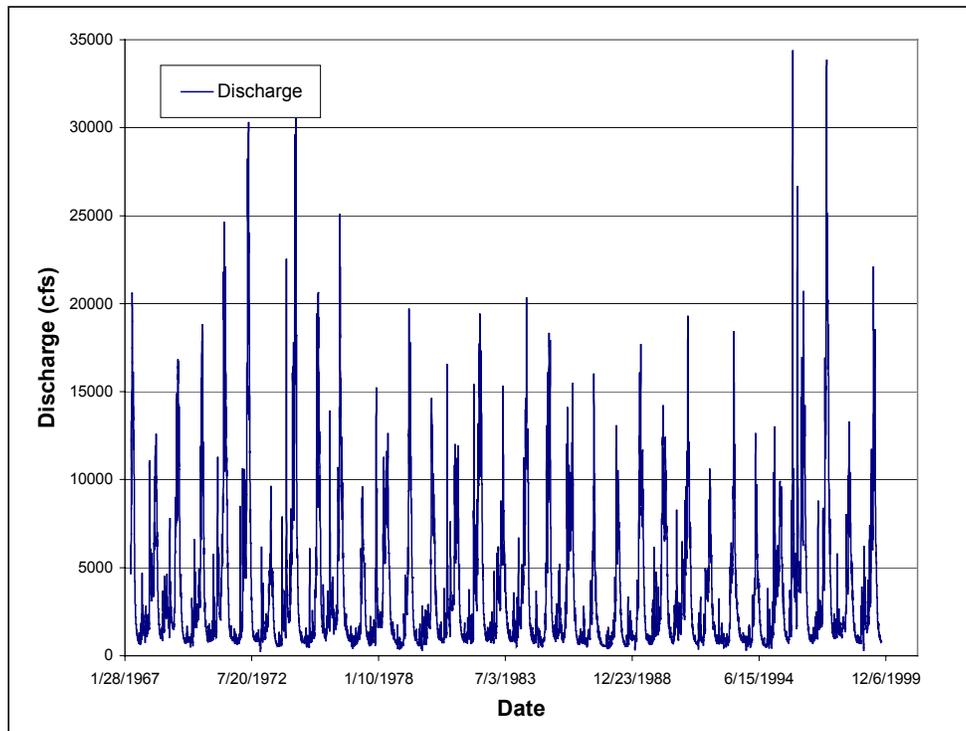


Figure 2-10. Daily Mean Discharge for the North Fork Clearwater River near Canyon Ranger Station, Idaho

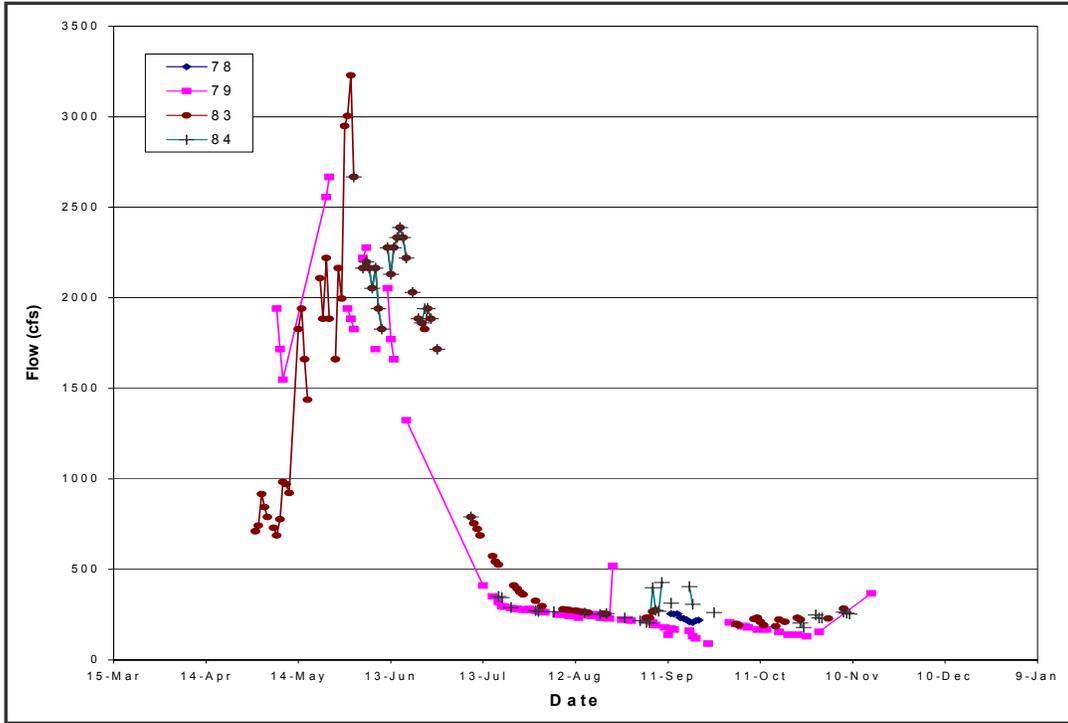


Figure 2-11. Kelly Creek North Fork Clearwater Flow Data

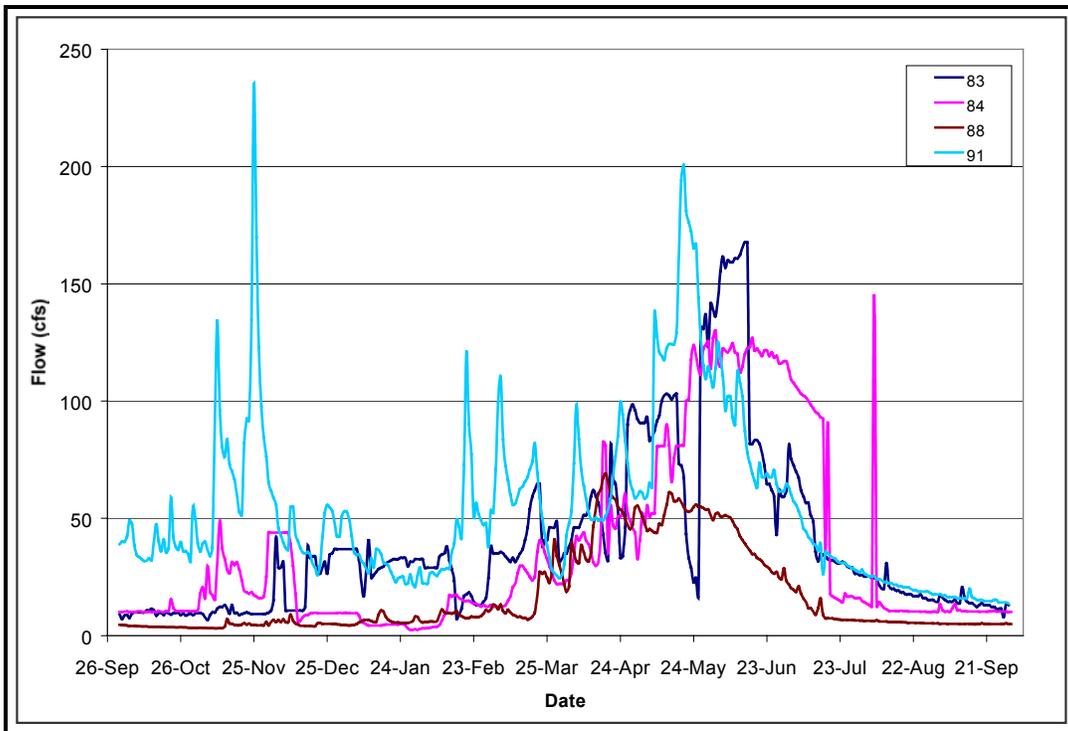


Figure 2-12. Cold Springs Creek Flow Data

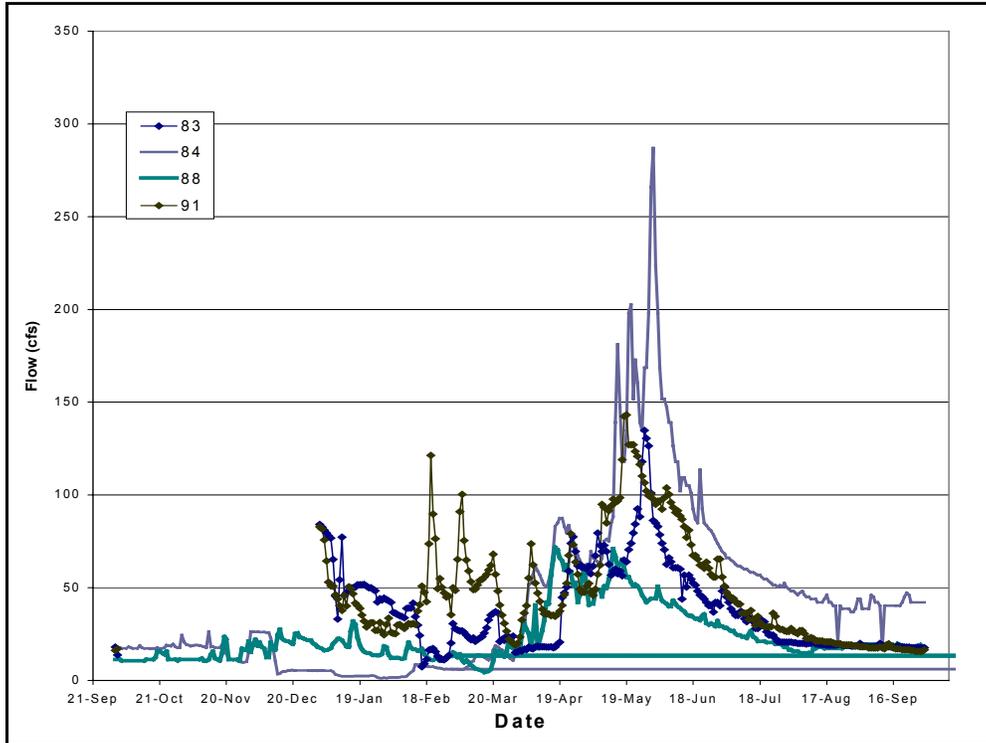


Figure 2-13. Swamp Creek Flow Data

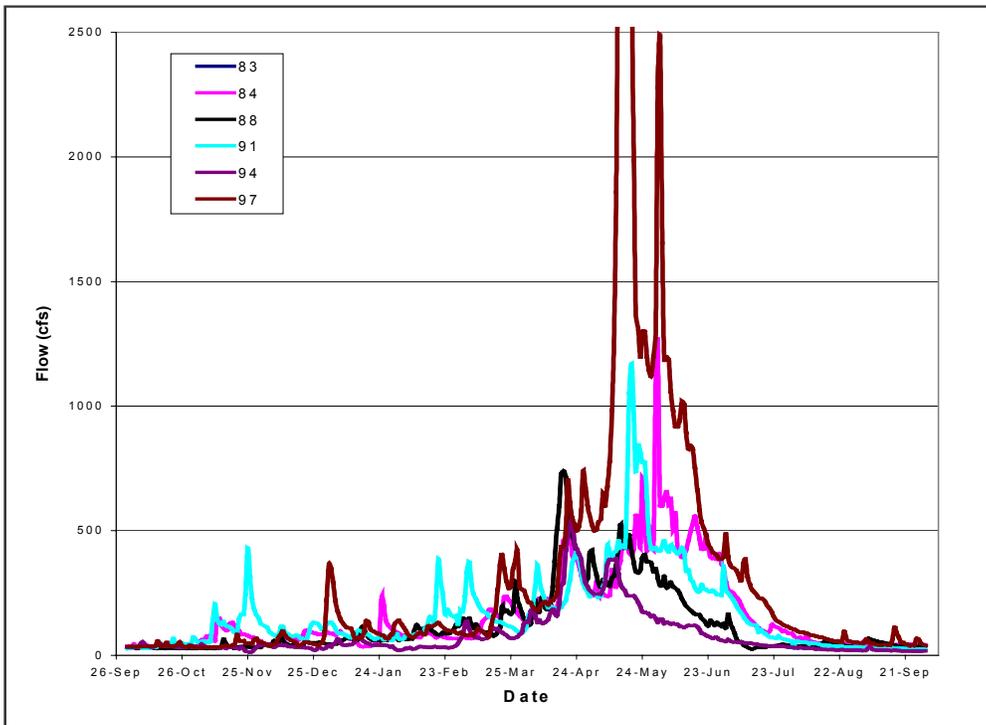


Figure 2-14. Quartz Creek Flow Data

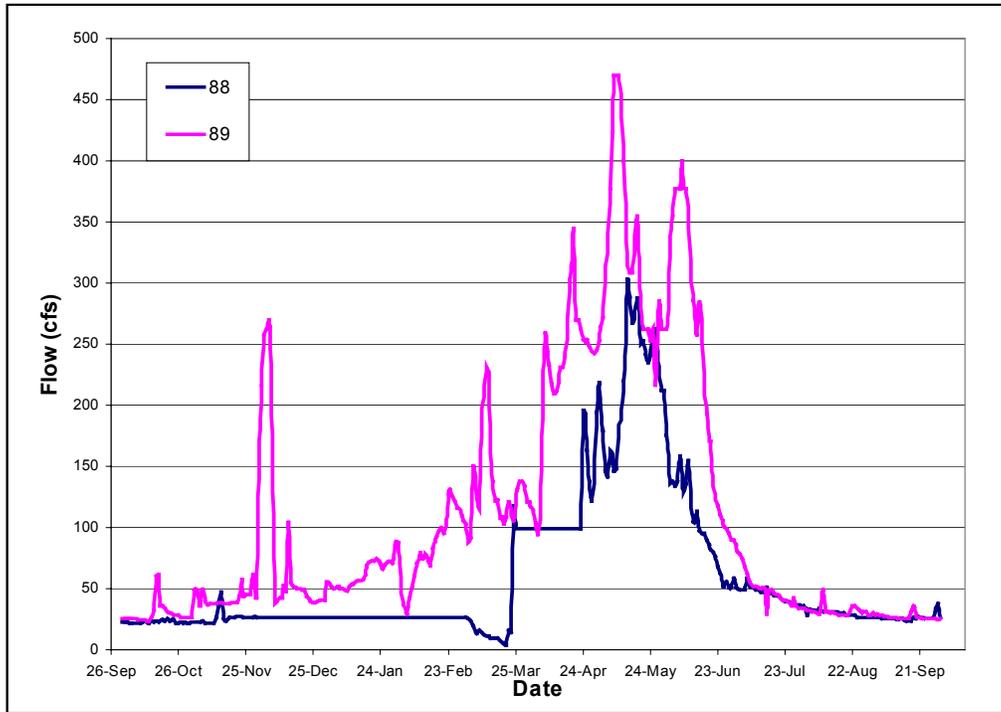


Figure 2-15. Gravey Creek Flow Data

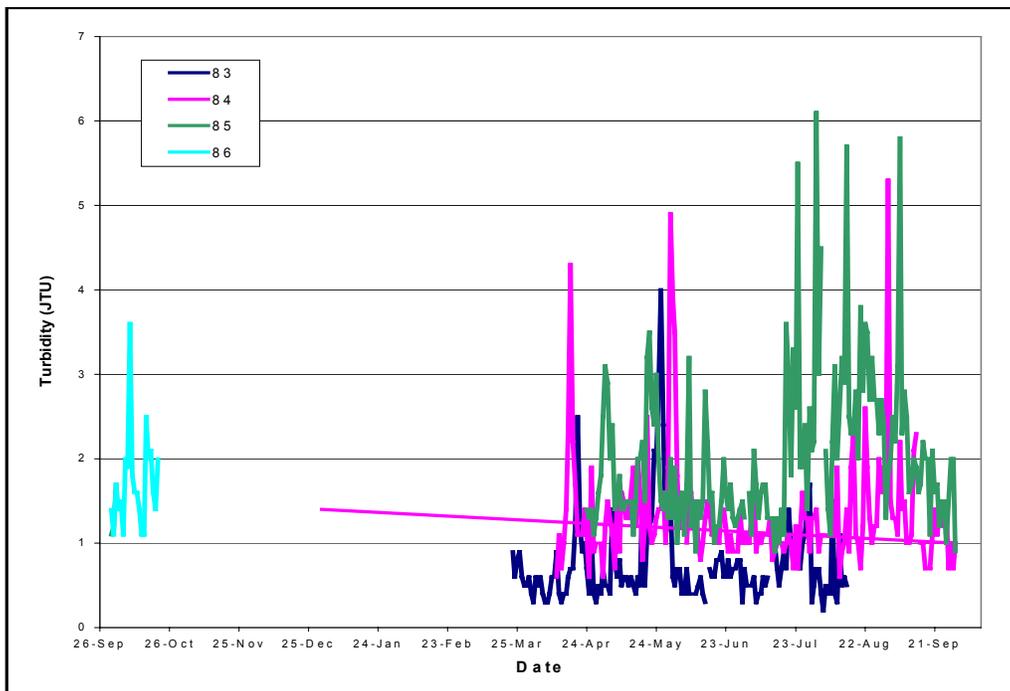


Figure 2-16. Cold Springs Creek Turbidity Data

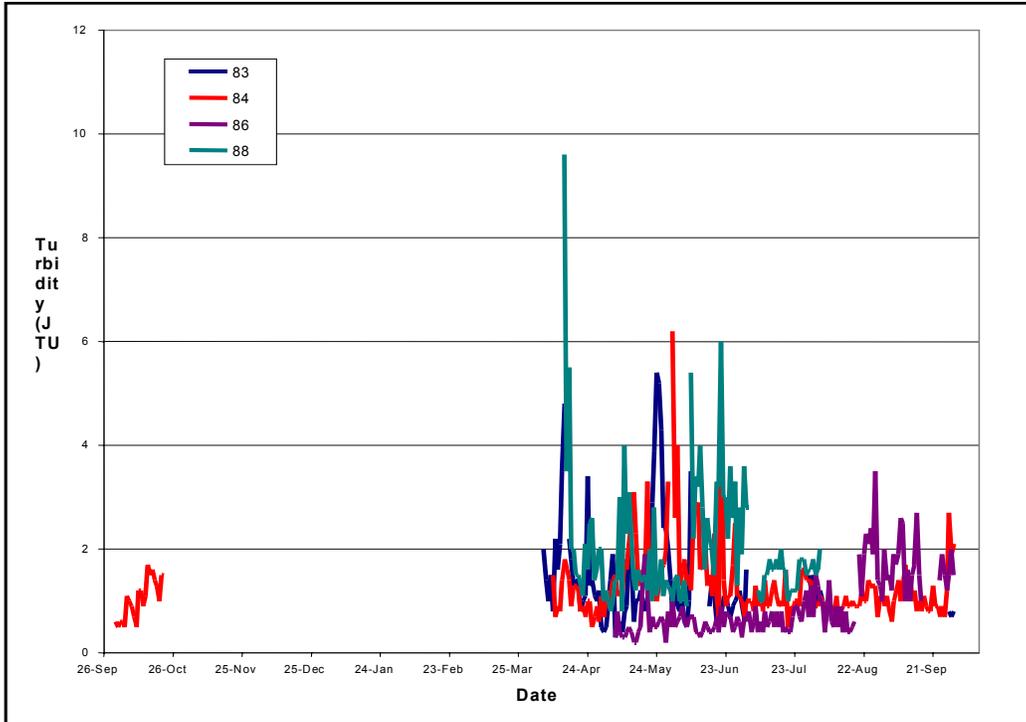


Figure 2-17. Swamp Creek Turbidity Data

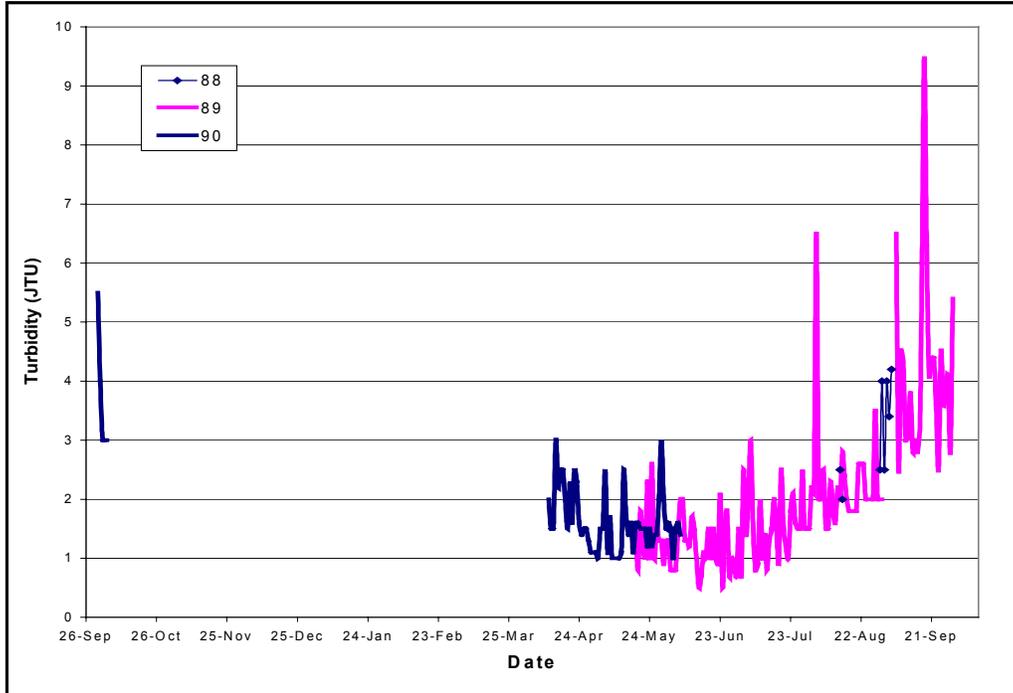


Figure 2-18. Quartz Creek Turbidity Data

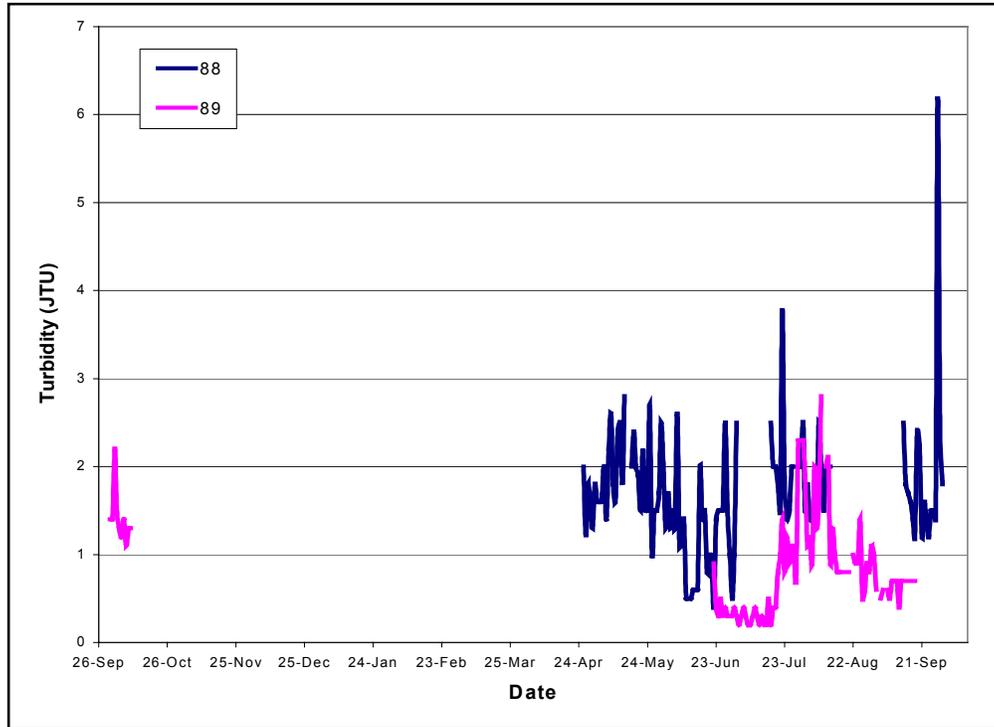


Figure 2-19. Gravey Creek Turbidity Data

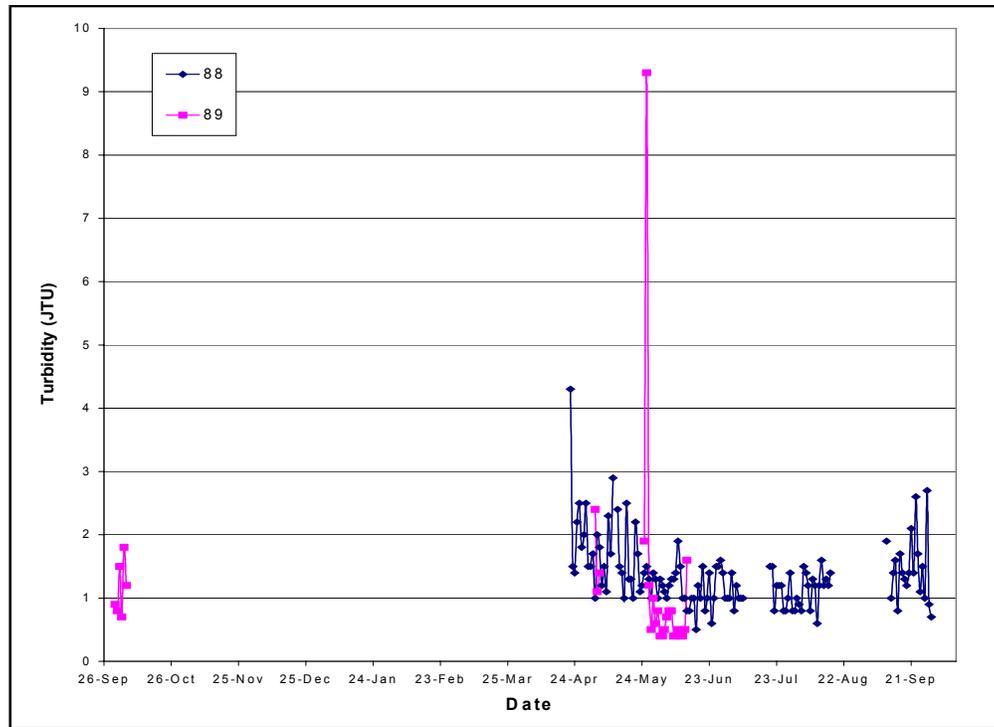


Figure 2-20. Marten Creek Turbidity Data

Appendix 3. Stream Temperature Data

Appendix 3. Stream Temperature Data

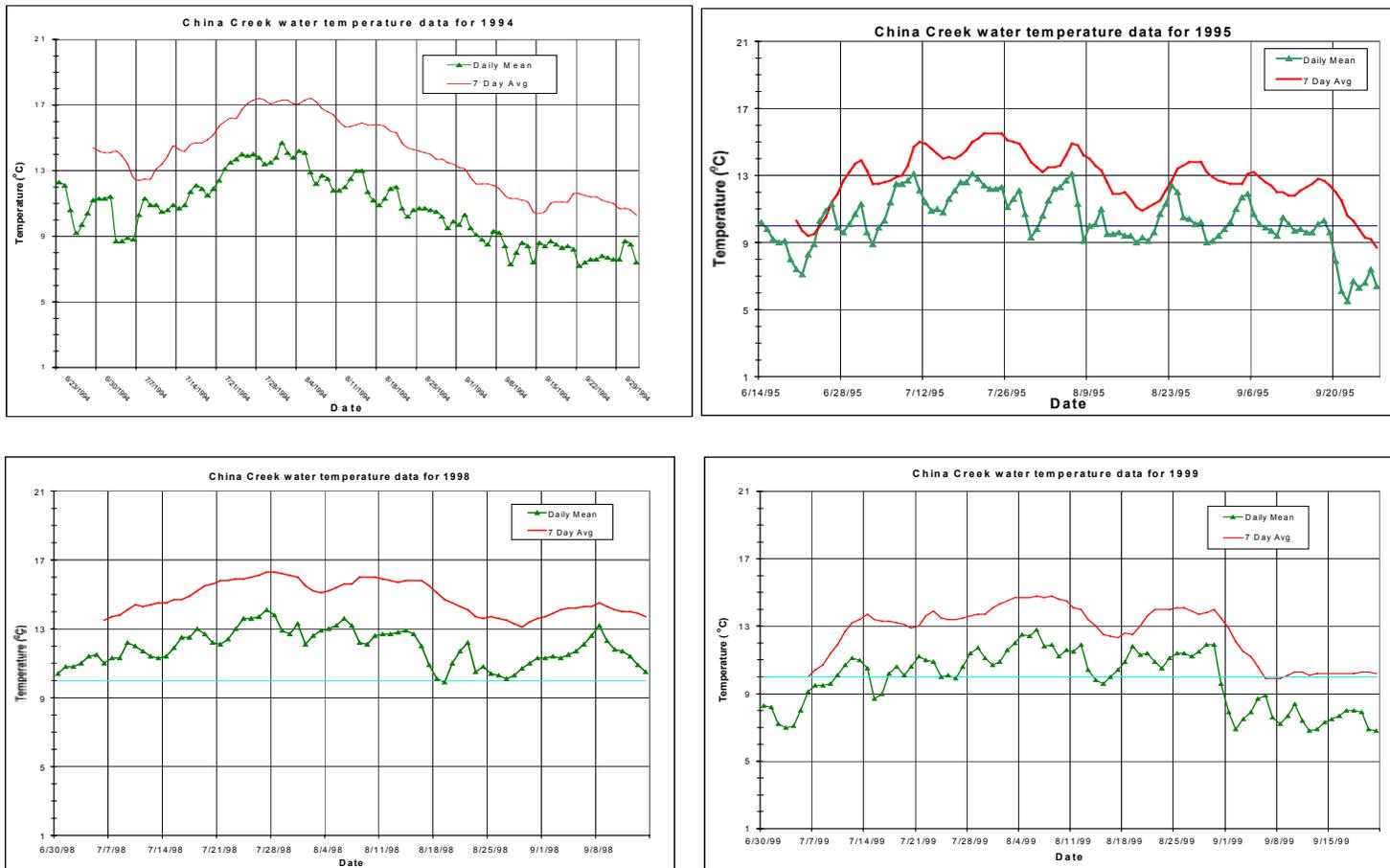


Figure 3-1. Selected Temperature Data for China Creek

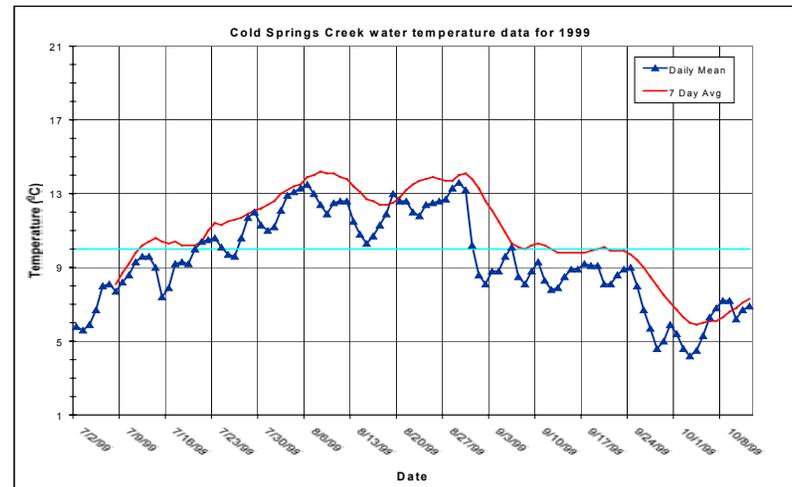
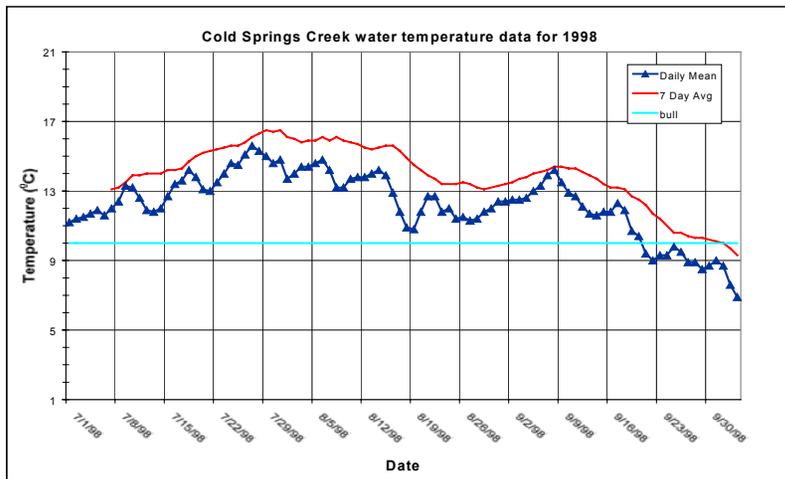


Figure 3-2. Selected Temperature Data for Cold Springs Creek

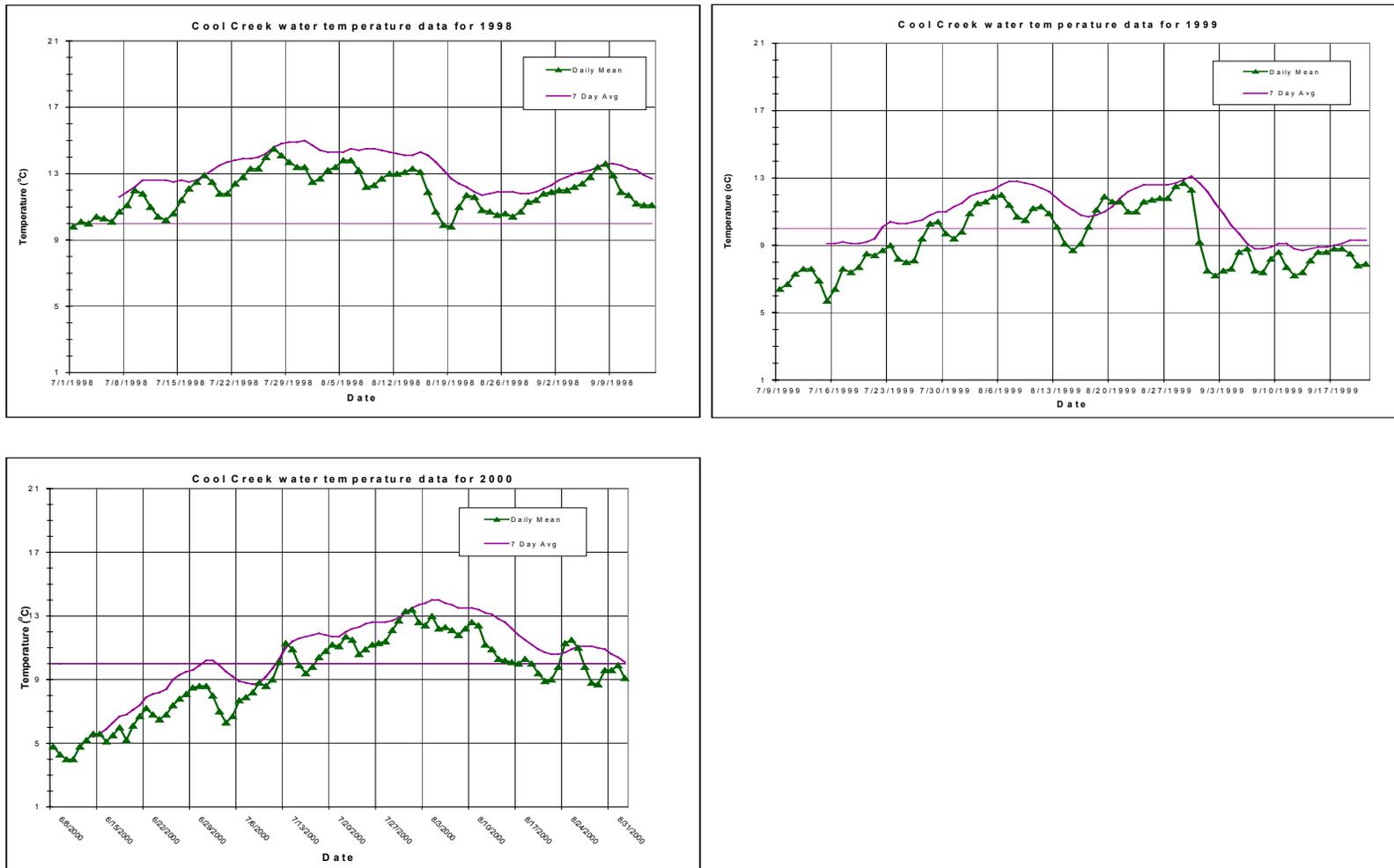


Figure 3-3. Selected Temperature Data for Cool Creek

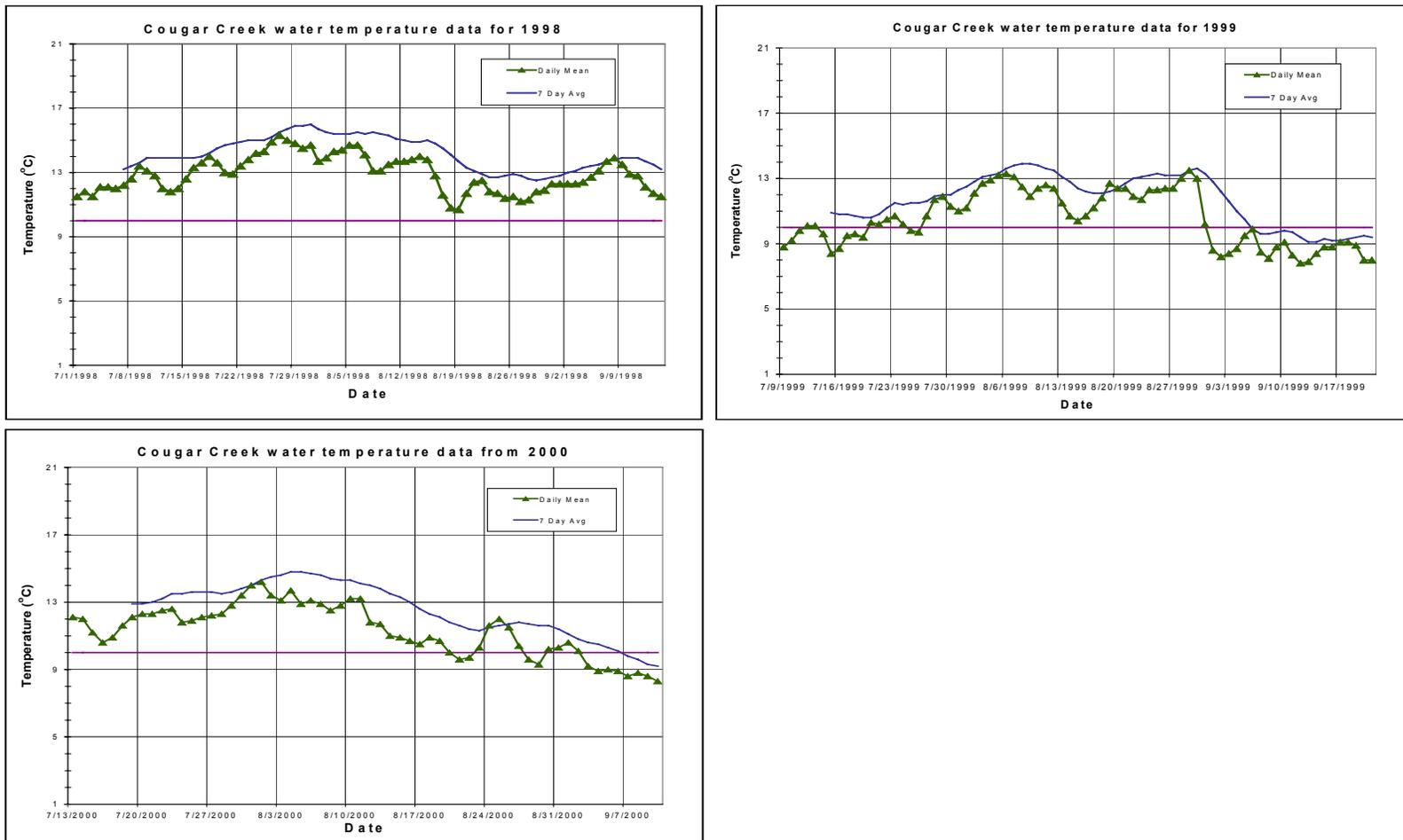


Figure 3-4. Selected Temperature Data for Cougar Creek

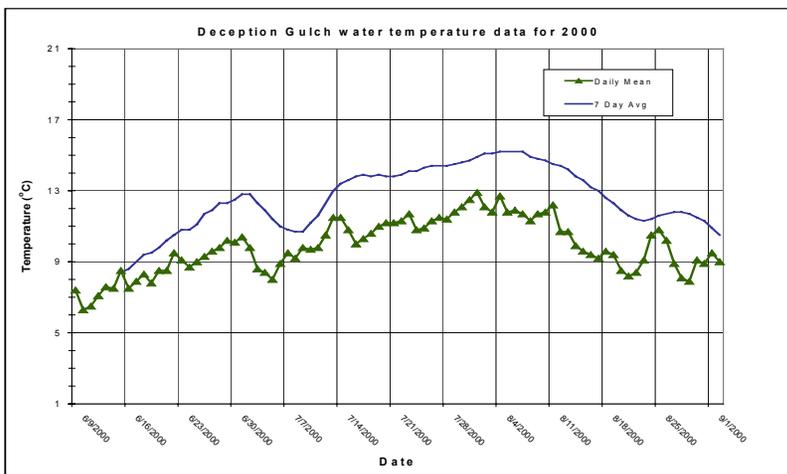


Figure 3-5. Selected Temperature Data for Deception Gulch

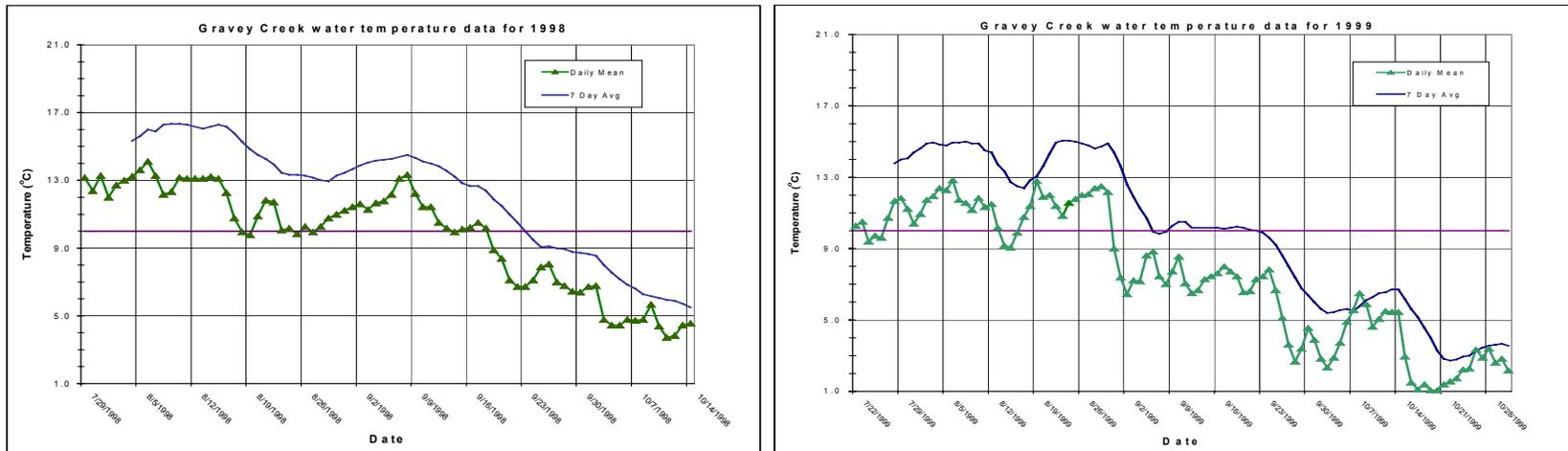


Figure 3-6. Selected Temperature Data for Gravey Creek

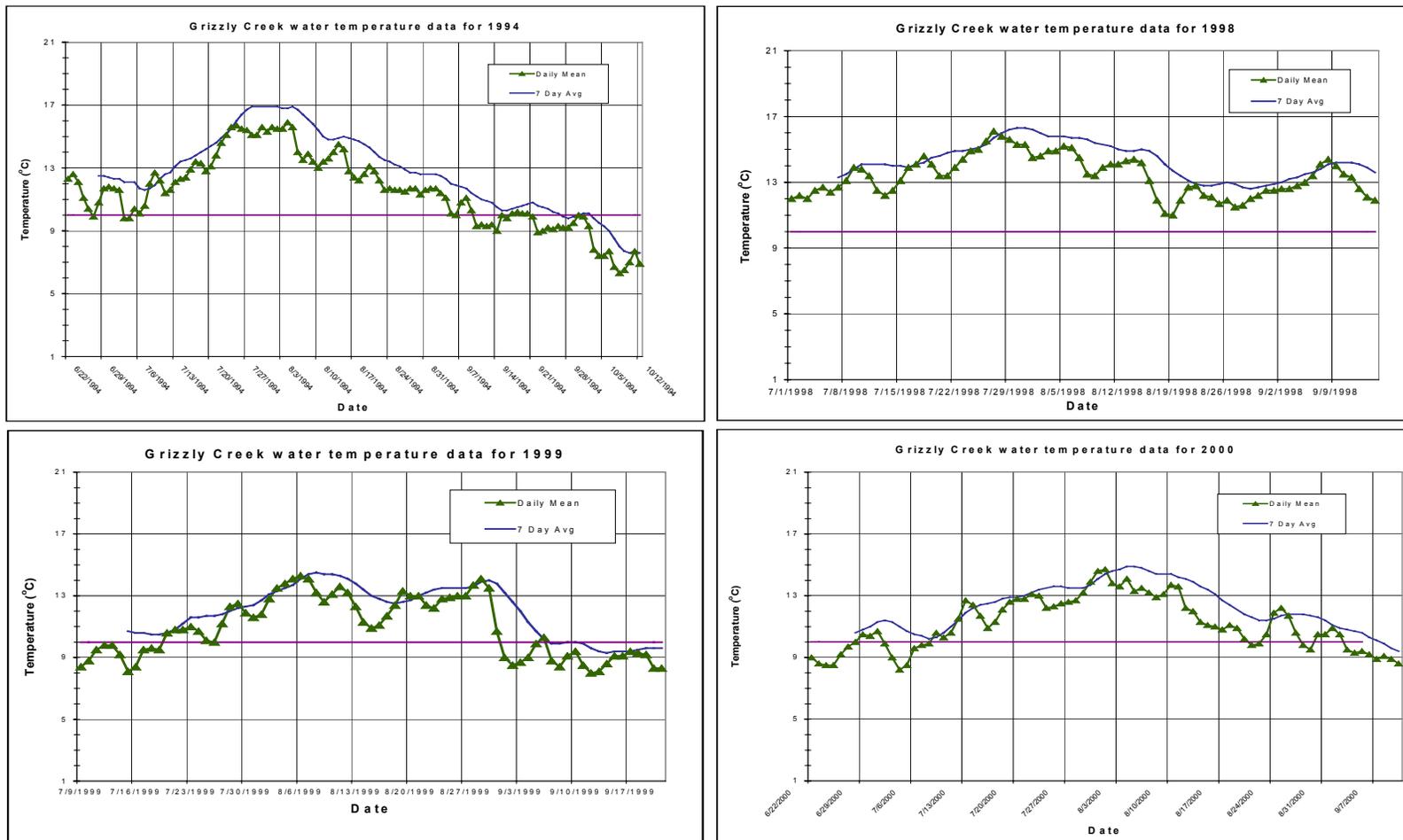


Figure 3-7. Selected Temperature Data for Grizzly Creek

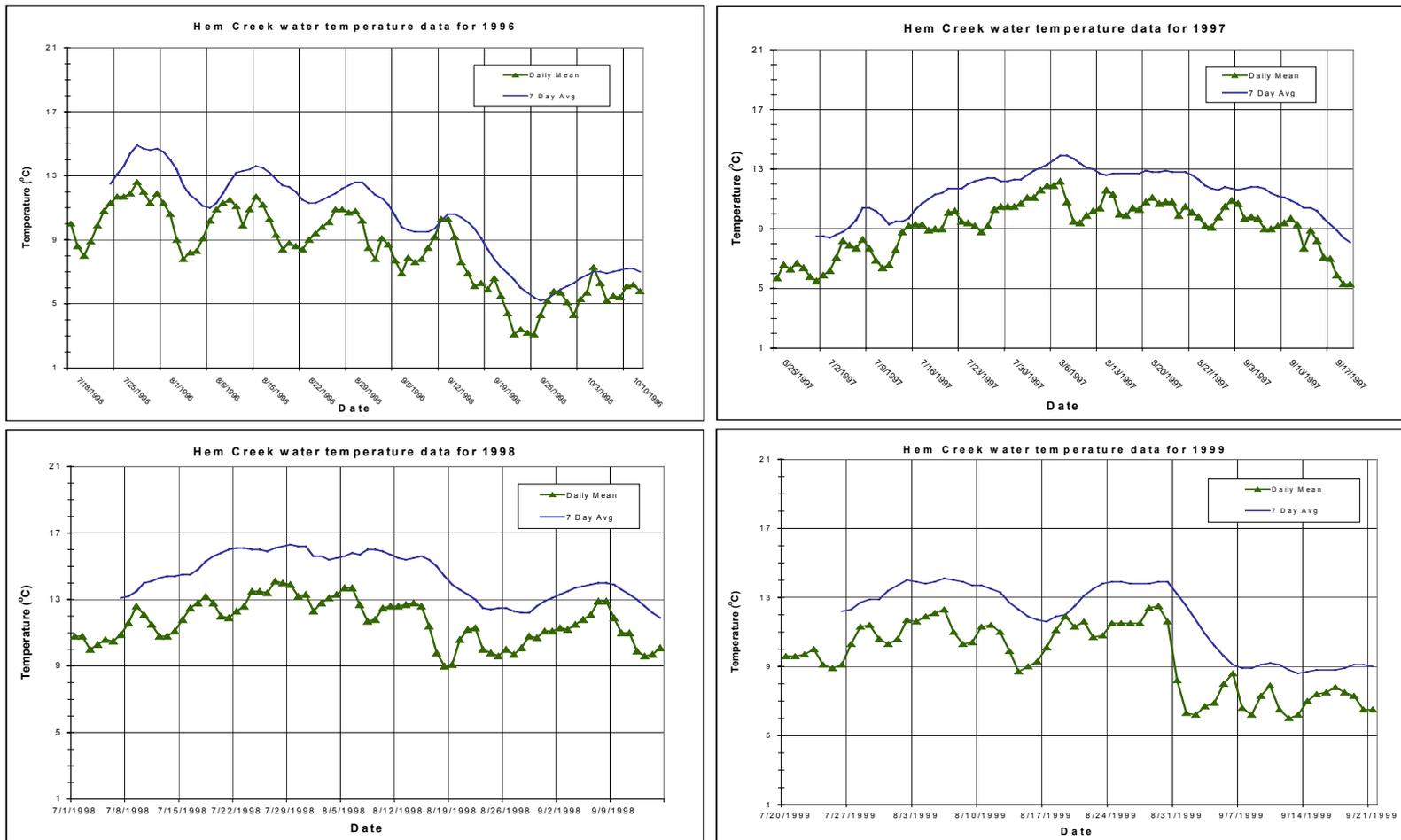


Figure 3-8. Selected Temperature Data for Hem Creek

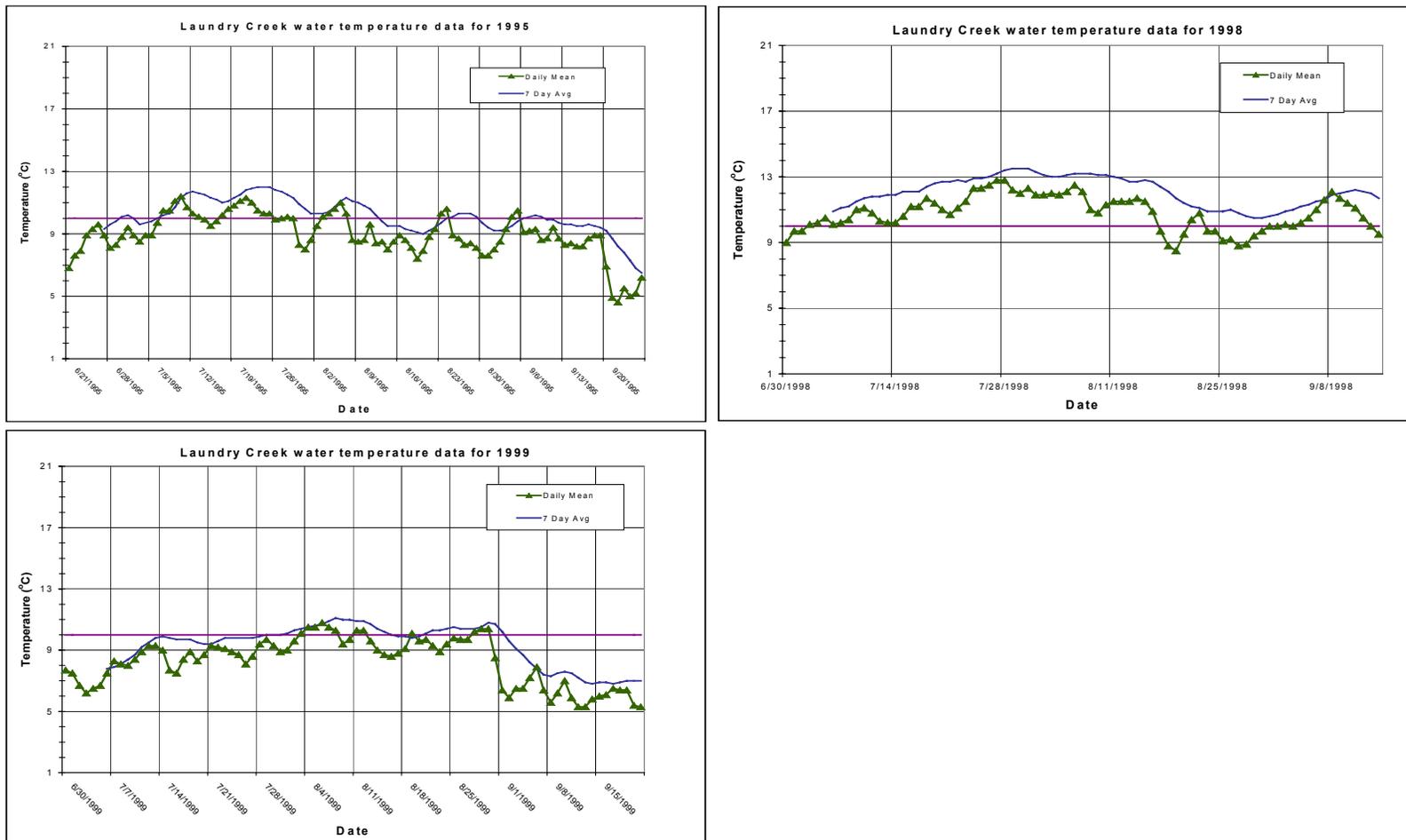


Figure 3-9. Selected Temperature Data for Laundry Creek

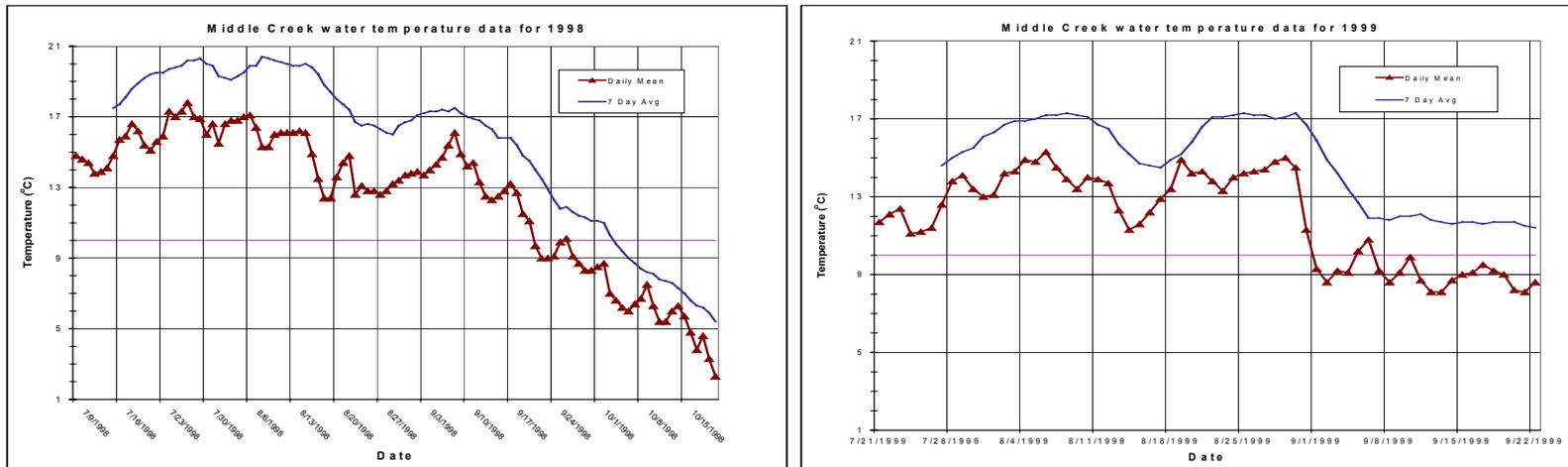


Figure 3-10. Selected Temperature Data for Middle Creek

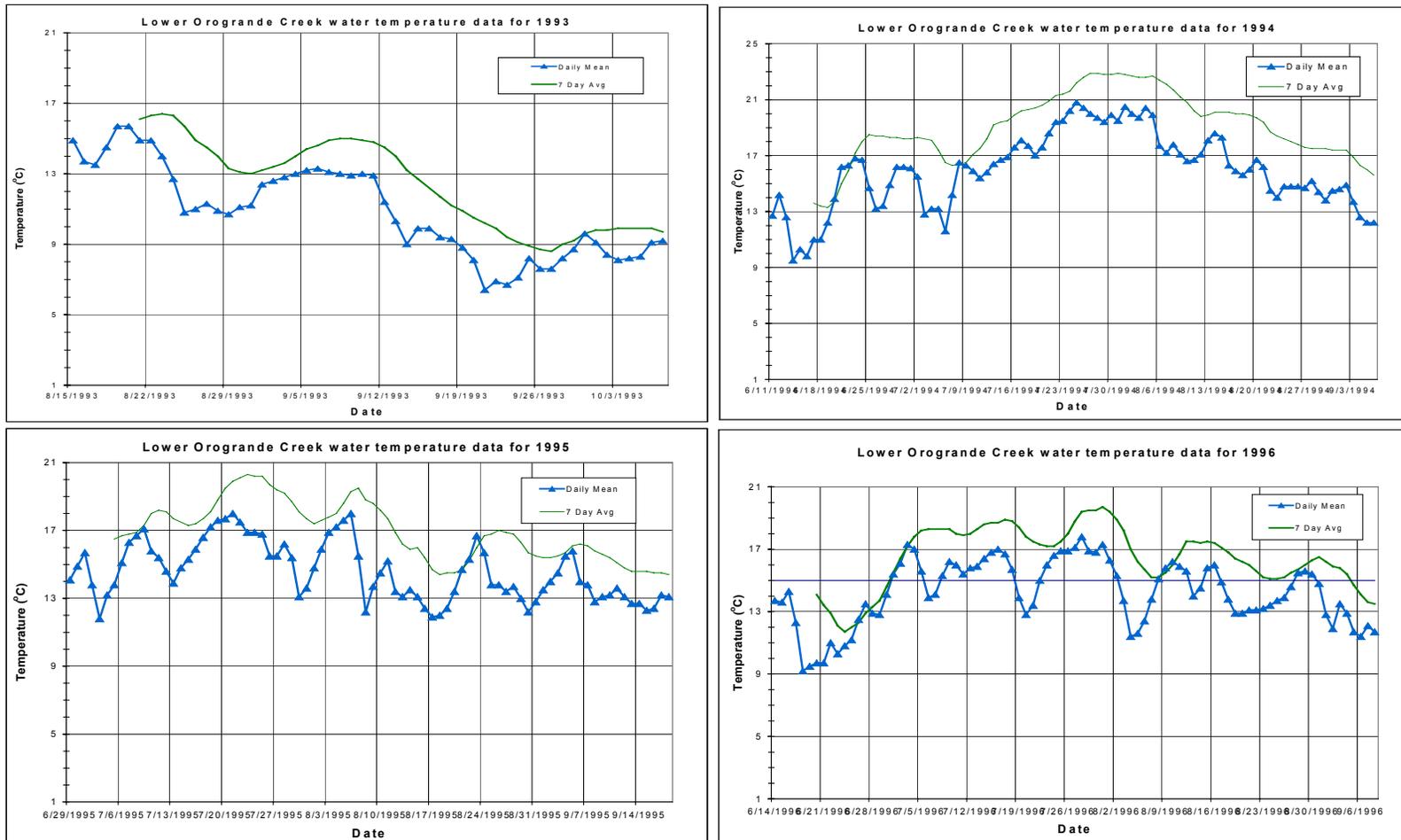


Figure 3-11. Selected Temperature Data for Lower Orogrande Creek

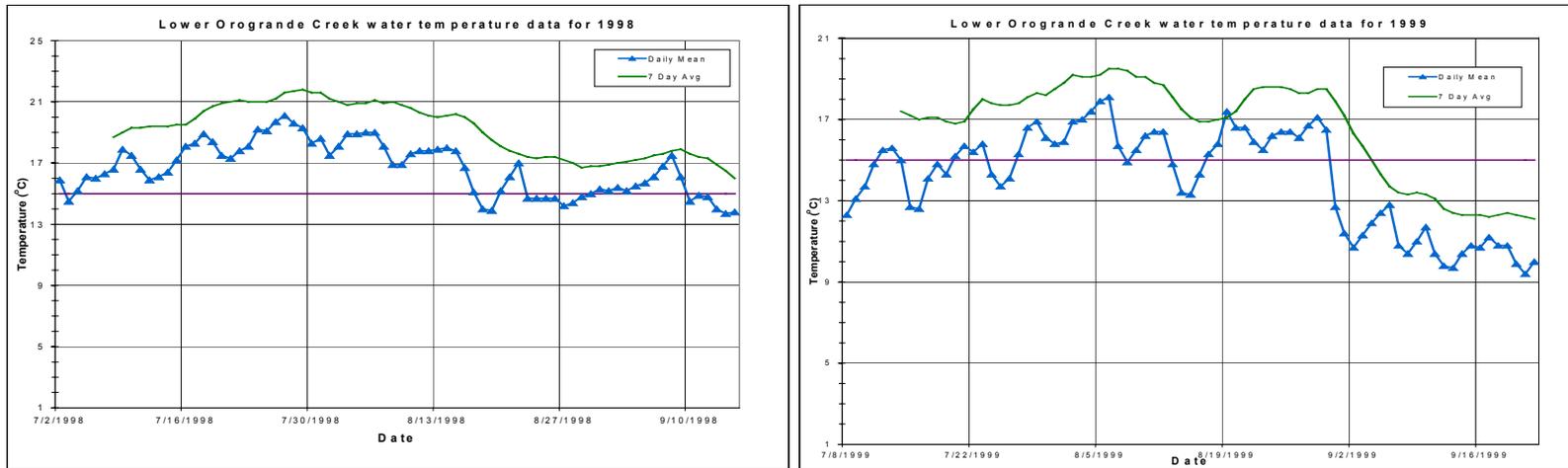


Figure 3-11 (continued). Selected Temperature Data for Lower Orogrande Creek

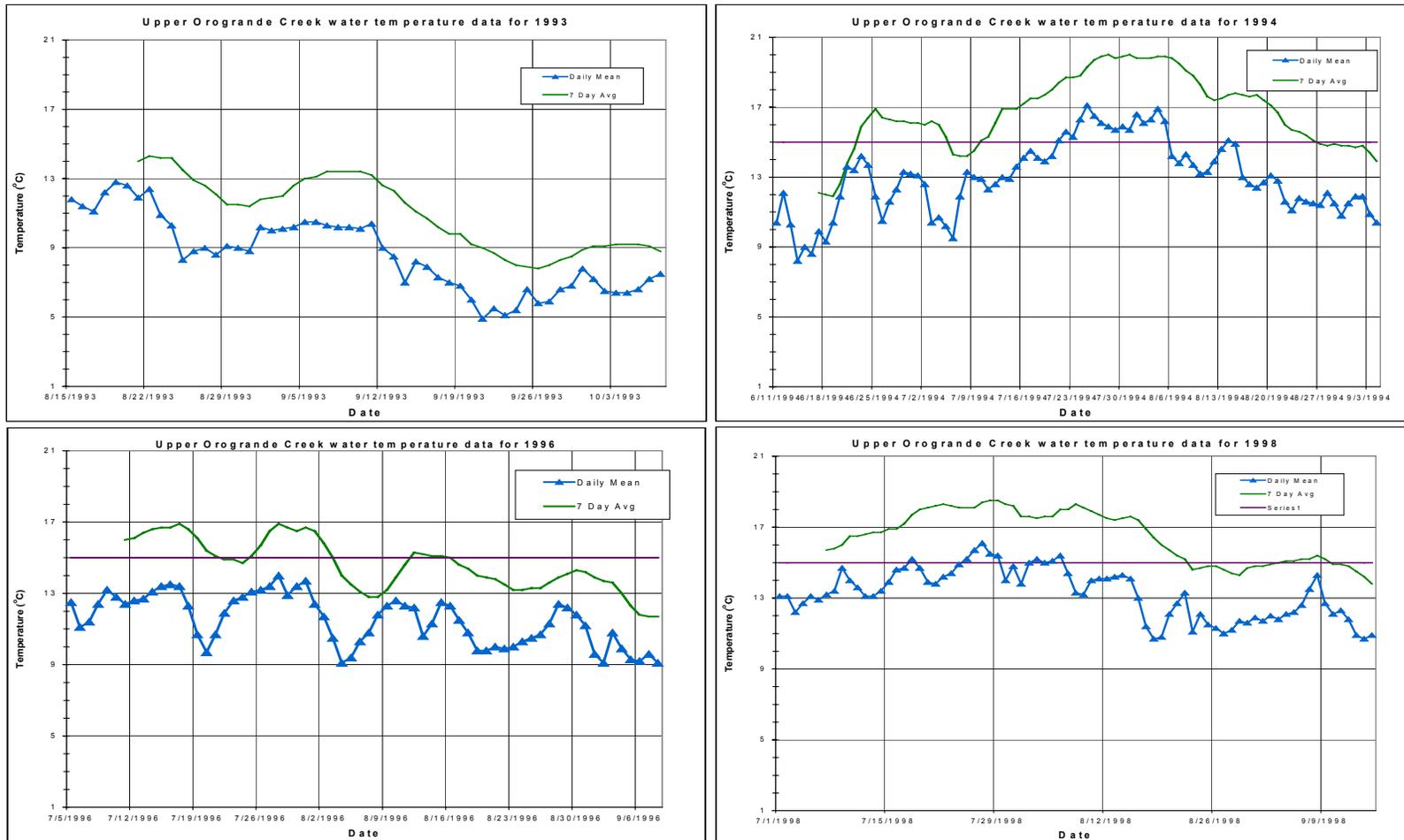


Figure 3-12. Selected Temperature Data for Upper Orogrande Creek

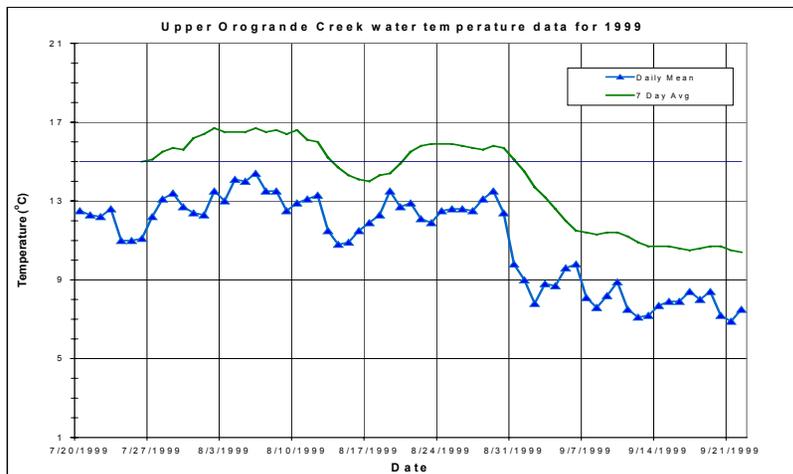


Figure 3-12 (continued). Selected Temperature Data for Upper Orogrande Creek

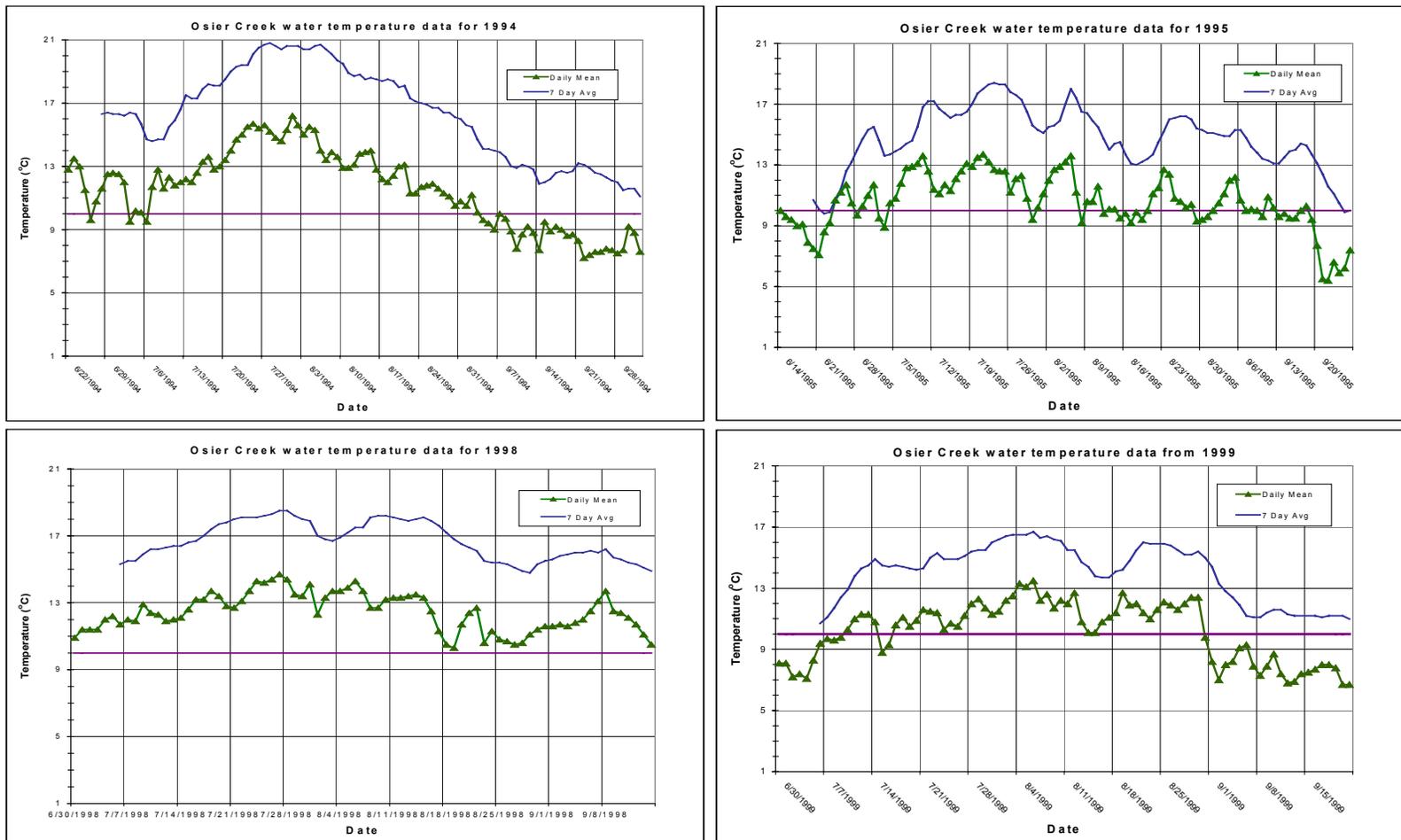


Figure 3-13. Selected Temperature Data for Osier Creek

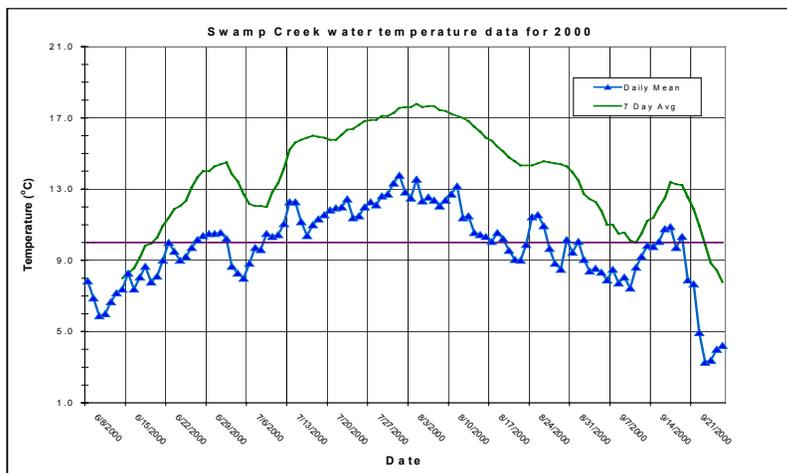


Figure 3-14. Selected Temperature Data for Swamp Creek

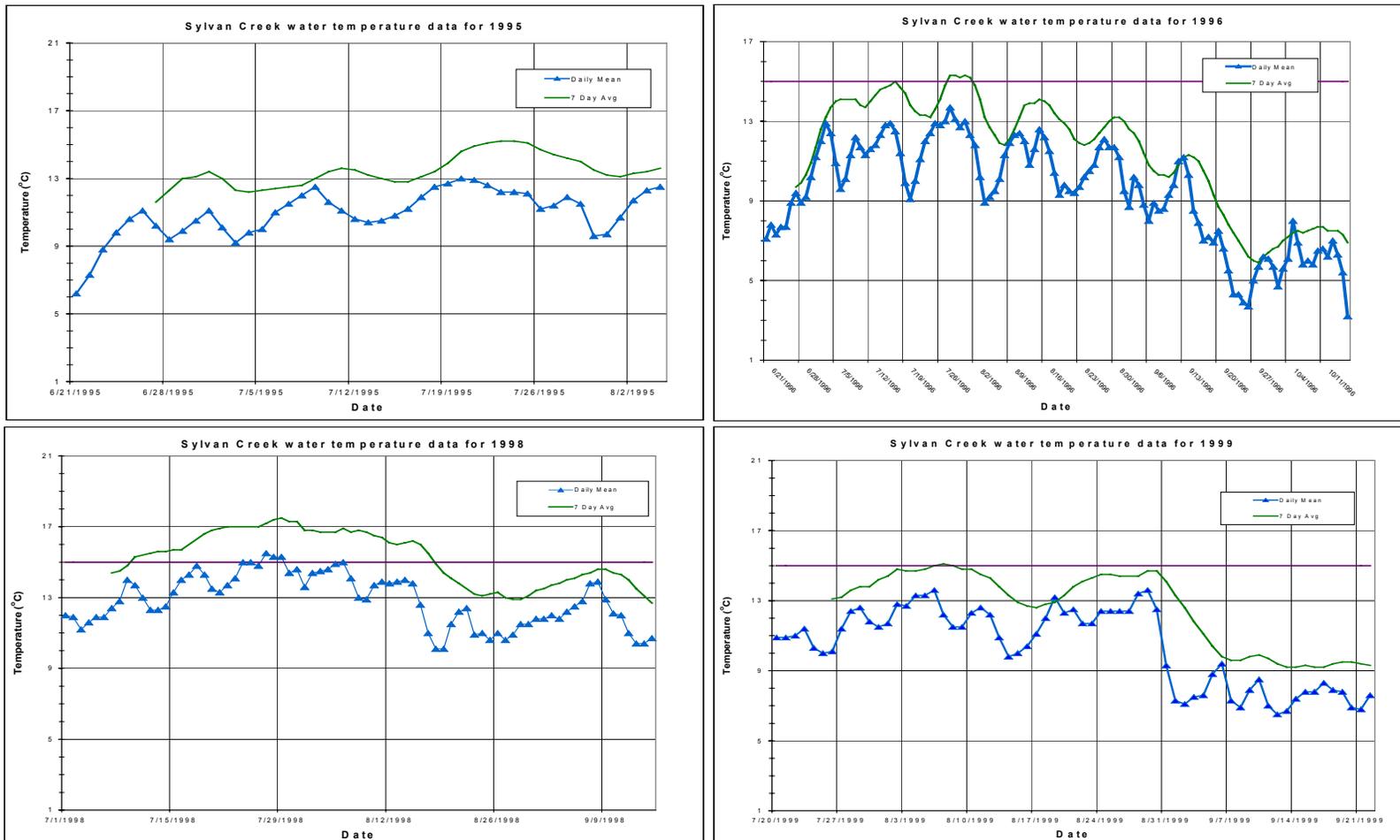


Figure 3-15. Selected Temperature Data for Sylvan Creek

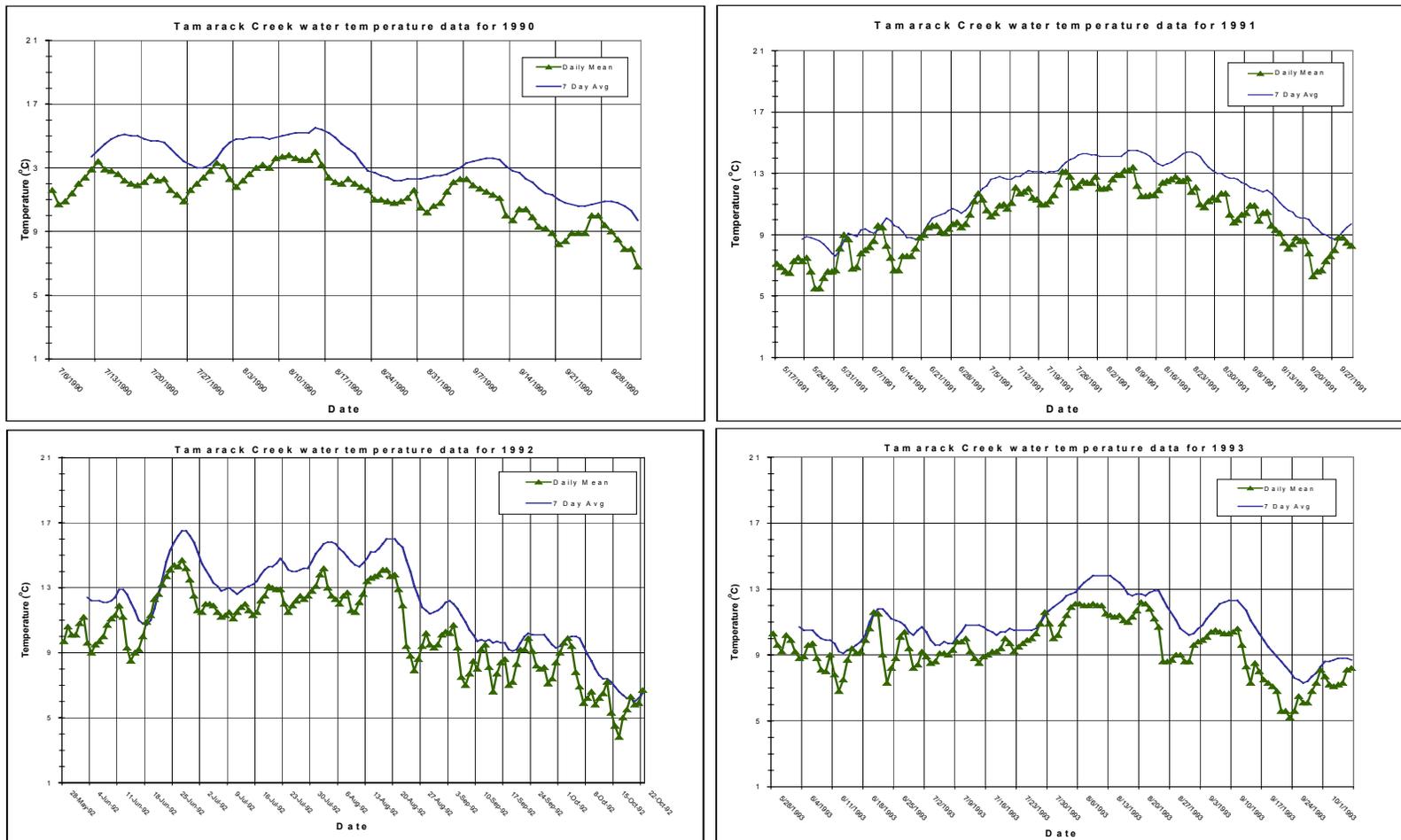


Figure 3-16. Selected Temperature Data for Tamarack Creek

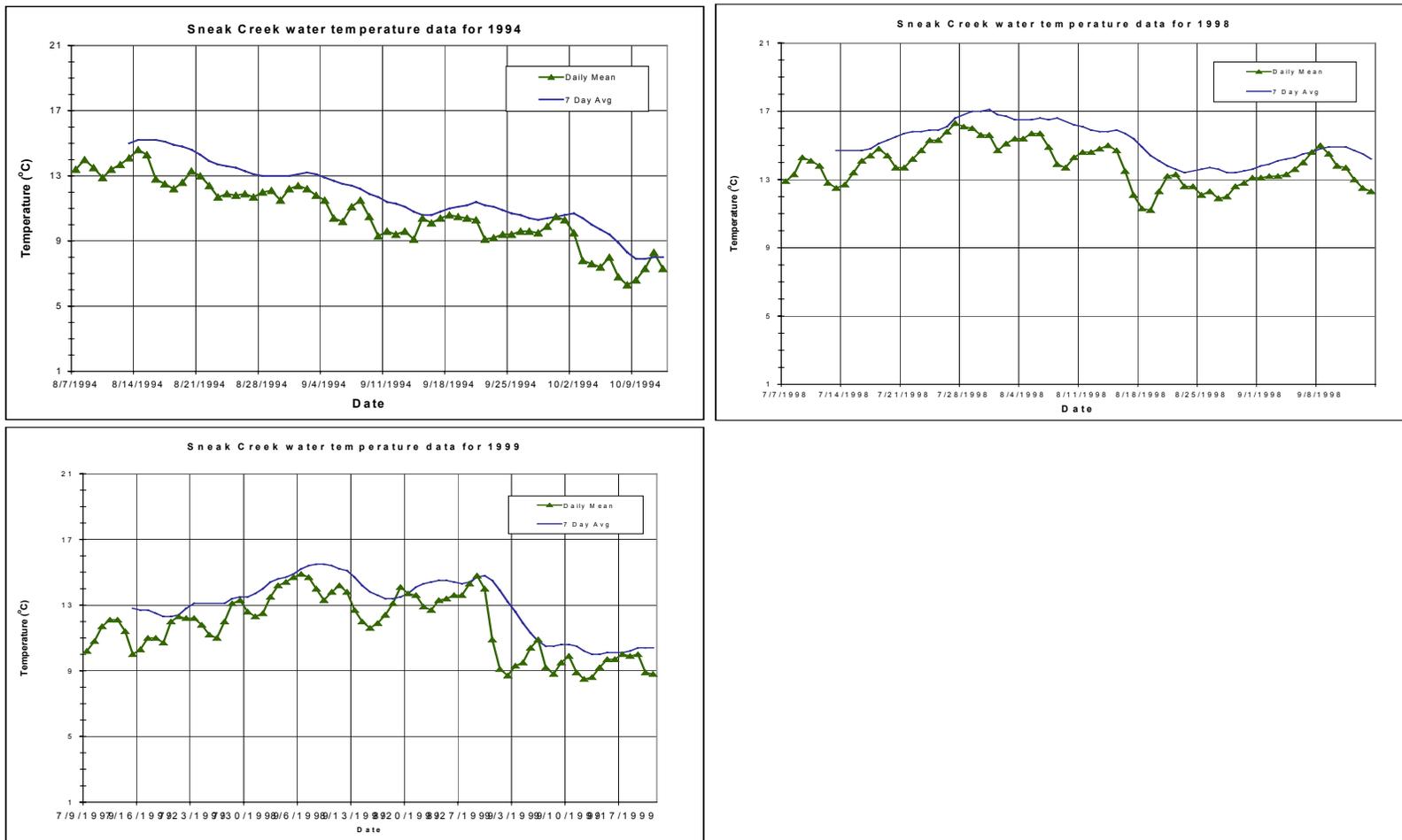


Figure 3-17. Selected Temperature Data for Sneak Creek

**Appendix 4. Orogrande Creek Watershed Temperature
TMDLs (includes Upper Orogrande Creek, Lower
Orogrande Creek, Tamarack Creek, and Sylvan Creek)**

An ArcView shapefile of
these data is on the diskette
located in the back of this document

Appendix 4. Orogrande Creek Watershed Temperature TMDLs (includes Upper Orogrande Creek, Lower Orogrande Creek, Tamarack Creek, and Sylvan Creek)

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitute the temperature TMDLs for upper Orogrande Creek, lower Orogrande Creek, Tamarack Creek, and Sylvan Creek. Figure 4-1 shows the distribution of stream segments needing increased percent canopy closure to meet the TMDLs targets. Table 4-1 presents the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 4-1 and the data presented in Table 4-1.

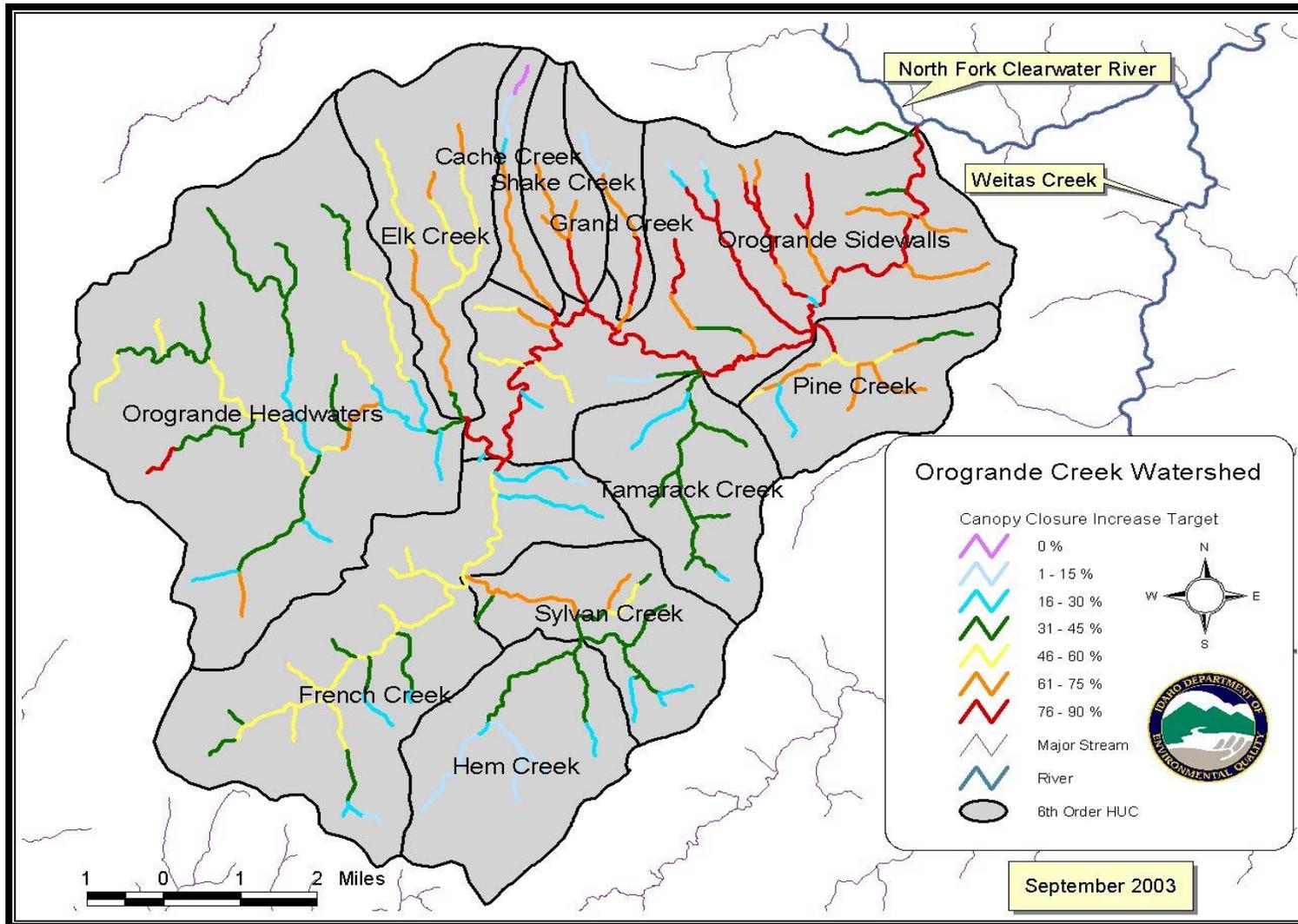


Figure 4-1. Targeted Percent Canopy Closure Increases for the Orogrande Creek Watershed

Table 4-1. Orogrande Creek watershed temperature TMDLs, stream reach by stream reach (includes TMDLs for upper Orogrande Creek, lower Orogrande Creek, Tamarack Creek, and Sylvan Creek).

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Bailey Gulch	1,844	3,400	75	120	100	25	70	17	76
Bailey Gulch	2,146	3,600	50	114	100	50	122	17	86
Bailey Gulch	1,746	3,800	50	108	100	50	122	17	86
Breakfast Creek	1,263	3,400	45	120	100	55	146	18	88
Breakfast Creek	5,674	3,600	45	114	100	55	146	18	88
Breakfast Creek	640	3,800	60	108	100	40	111	18	84
Breakfast Creek	7,078	3,800	45	108	100	55	146	18	88
Breakfast Creek	5,408	3,800	60	108	100	40	111	18	84
Breakfast Creek	1,865	3,800	60	108	100	40	111	18	84
Breakfast Creek	4,787	3,800	60	108	100	40	111	18	84
Breakfast Creek	3,512	4,000	40	101	100	60	157	18	89
Breakfast Creek	2,513	4,000	60	101	100	40	111	18	84
Breakfast Creek	4,312	4,000	40	101	100	60	157	18	89
Cache Creek	1,253	3,000	20	132	100	80	185	17	91
Cache Creek	1,777	3,200	30	126	100	70	164	17	90
Cache Creek	2,454	3,400	30	120	100	70	164	17	90

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Cache Creek	2,704	3,600	30	114	100	70	164	17	90
Cache Creek	2,953	3,800	30	108	100	70	164	17	90
Cache Creek	2,289	4,000	30	101	100	70	164	17	90
Cache Creek	1,840	4,200	75	95	95	20	70	28	60
Cache Creek	1,395	4,400	75	89	89	14	70	40	43
Cache Creek	1,056	4,600	75	83	83	8	70	53	24
Cache Creek	1,123	4,800	75	77	77	2	70	65	7
Cache Creek	1,335	5,000	75	71	75	0	70	78	0
Cache Creek	974	5,200	75	64	75	0	70	93	0
China Gulch	1,625	4,400	45	89	89	44	146	43	71
Copper Creek	1,829	3,600	45	114	100	55	133	17	87
Copper Creek	4,620	3,800	45	108	100	55	133	17	87
Copper Creek	2,019	4,000	30	101	100	70	164	17	90
Cottonwood Creek	2,018	3,000	30	132	100	70	181	18	90
Cottonwood Creek	1,249	3,000	60	132	100	40	111	18	84
Cottonwood Creek	1,973	3,200	60	126	100	40	111	18	84
Cottonwood Creek	1,522	3,400	30	120	100	70	181	18	90
Cottonwood Creek	1,618	3,600	30	114	100	70	181	18	90
Cottonwood Creek	4,794	3,800	20	108	100	80	204	18	91

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Crystal Creek	1,054	3,400	70	120	100	30	80	17	79
Crystal Creek	7,600	3,600	70	114	100	30	80	17	79
Crystal Creek	4,603	3,800	60	108	100	40	101	17	83
Crystal Creek	4,988	4,000	60	101	100	40	101	17	83
Crystal Creek	11,319	4,000	60	101	100	40	101	17	83
E.F. Elk Creek	3,717	3,600	45	114	100	55	133	17	87
E.F. Elk Creek	3,070	3,600	45	114	100	55	133	17	87
E.F. Elk Creek	6,719	3,800	45	108	100	55	133	17	87
E.F. Elk Creek	2,327	4,000	30	101	100	70	164	17	90
E.F. French Creek	4,623	4,000	45	101	100	55	133	17	87
E.F. French Creek	4,109	4,200	60	95	95	35	101	28	72
E.F. French Creek	924	4,400	60	89	89	29	101	40	60
E.F. French Creek	252	4,400	60	89	89	29	101	40	60
E.F. French Creek	1,268	4,400	60	89	89	29	101	40	60
E.F. French Creek	1,562	4,600	80	83	83	3	59	53	10
Elk Creek	2,874	3,200	60	126	100	40	101	17	83
Elk Creek	1,781	3,400	30	120	100	70	164	17	90
Elk Creek	3,367	3,400	30	120	100	70	164	17	90
Elk Creek	1,938	3,600	30	114	100	70	164	17	90

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Fidelity Gulch	3,750	4,000	45	101	100	55	133	17	87
Fir Creek	1,409	2,800	45	139	100	55	146	18	88
Fir Creek	3,248	3,000	30	132	100	70	181	18	90
Fir Creek	1,283	3,200	30	126	100	70	181	18	90
Fir Creek	1,750	3,200	75	126	100	25	76	18	76
Fir Creek	1,270	3,400	45	120	100	55	146	18	88
Fir Creek	1,436	3,400	75	120	100	25	76	18	76
Fir Creek	1,204	3,600	75	114	100	25	76	18	76
French Creek	1,172	3,200	20	126	100	80	204	18	91
French Creek	1,932	3,200	45	126	100	55	146	18	88
French Creek	3,187	3,200	45	126	100	55	146	18	88
French Creek	1,306	3,400	75	120	100	25	76	18	76
French Creek	1,486	3,400	75	120	100	25	76	18	76
French Creek	5,107	3,400	50	120	100	50	134	18	87
French Creek	5,869	3,600	50	114	100	50	134	18	87
French Creek	2,063	3,600	50	114	100	50	134	18	87
French Creek	462	3,600	75	114	100	25	76	18	76
French Creek	625	3,600	75	114	100	25	76	18	76
French Creek	782	3,800	45	108	100	55	146	18	88

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
French Creek	2,915	3,800	45	108	100	55	146	18	88
French Creek	894	3,800	45	108	100	55	146	18	88
French Creek	3,238	3,800	45	108	100	55	146	18	88
French Creek	436	3,800	45	108	100	55	146	18	88
French Creek	2,261	3,800	65	108	100	35	99	18	82
French Creek	2,145	3,800	50	108	100	50	134	18	87
French Creek	957	3,800	75	108	100	25	76	18	76
French Creek	2,013	3,800	75	108	100	25	76	18	76
French Creek	1,138	3,800	60	108	100	40	111	18	84
French Creek	1,193	3,800	50	108	100	50	134	18	87
French Creek	2,634	4,000	45	101	100	55	146	18	88
French Creek	2,001	4,000	50	101	100	50	134	18	87
French Creek	1,934	4,000	50	101	100	50	134	18	87
French Creek	2,249	4,000	45	101	100	55	146	18	88
French Creek	1,790	4,000	75	101	100	25	76	18	76
French Creek	1,611	4,000	75	101	100	25	76	18	76
French Creek	2,465	4,000	60	101	100	40	111	18	84
French Creek	2,899	4,000	65	101	100	35	99	18	82
French Creek	1,611	4,000	50	101	100	50	134	18	87

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
French Creek	4,180	4,200	45	95	95	50	146	29	80
French Creek	1,486	4,200	75	95	95	20	76	29	62
French Creek	2,165	4,200	75	95	95	20	76	29	62
French Creek	1,832	4,200	60	95	95	35	111	29	74
French Creek	1,519	4,200	65	95	95	30	99	29	71
French Creek	1,393	4,200	45	95	95	50	146	29	80
French Creek	1,159	4,400	75	89	89	14	76	43	43
French Creek	2,232	4,400	45	89	89	44	146	43	71
French Creek	940	4,600	60	83	83	23	111	57	49
French Creek	1,734	4,600	65	83	83	18	99	57	42
Fuzzy Creek	911	2,600	30	145	100	70	197	18	91
Fuzzy Creek	841	2,800	30	139	100	70	197	18	91
Fuzzy Creek	1,383	3,000	30	132	100	70	197	18	91
Fuzzy Creek	1,770	3,200	30	126	100	70	197	18	91
Fuzzy Creek	1,596	3,600	30	114	100	70	197	18	91
Grand Creek	656	3,000	30	132	100	70	164	17	90
Grand Creek	1,274	3,200	30	126	100	70	164	17	90
Grand Creek	2,488	3,400	20	120	100	80	185	17	91
Grand Creek	1,687	3,600	20	114	100	80	185	17	91

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Grand Creek	1,372	3,800	20	108	100	80	185	17	91
Grand Creek	1,386	4,000	30	101	100	70	164	17	90
Grand Creek	3,809	4,200	30	95	95	65	164	28	83
Grand Creek	977	4,400	75	89	89	14	70	40	43
Grand Creek	2,036	4,400	75	89	89	14	70	40	43
Grand Creek	1,604	4,600	75	83	83	8	70	53	24
Hem Creek	1,304	3,800	60	108	100	40	111	18	84
Hem Creek	4,087	4,000	60	101	100	40	111	18	84
Hem Creek	5,418	4,200	60	95	95	35	111	29	74
Hem Creek	1,226	4,200	75	95	95	20	76	29	62
Hem Creek	3,146	4,400	75	89	89	14	76	43	43
Hem Creek	4,643	4,400	75	89	89	14	76	43	43
Hem Creek	447	4,600	75	83	83	8	76	57	25
Hem Creek	1,395	4,600	75	83	83	8	76	57	25
Hem Creek	1,805	4,600	75	83	83	8	76	57	25
Hem Creek	2,437	4,600	75	83	83	8	76	57	25
Hem Creek	938	4,800	75	77	77	2	76	71	7
Hem Creek	2,081	4,800	75	77	77	2	76	71	7
Hook Creek	2,808	2,800	20	139	100	80	185	17	91

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Hook Creek	2,402	3,000	10	132	100	90	206	17	92
Hook Creek	1,530	3,200	10	126	100	90	206	17	92
Hook Creek	3,280	3,400	20	120	100	80	185	17	91
Hook Creek	1,634	3,600	10	114	100	90	206	17	92
Hook Creek	1,439	3,800	10	108	100	90	206	17	92
Hook Creek	1,727	3,800	10	108	100	90	206	17	92
Hook Creek	2,117	4,000	10	101	100	90	206	17	92
Hook Creek	1,439	4,000	75	101	100	25	70	17	76
Hook Creek	1,667	4,200	75	95	95	20	70	28	60
Hook Creek	1,104	4,200	75	95	95	20	70	28	60
Hook Creek	763	4,400	75	89	89	14	70	40	43
Hook Creek	618	4,400	75	89	89	14	70	40	43
Irish Creek	1,095	3,400	60	120	100	40	101	17	83
Irish Creek	3,623	3,600	60	114	100	40	101	17	83
Jazz Creek	585	2,800	30	139	100	70	164	17	90
Jazz Creek	1,578	3,000	30	132	100	70	164	17	90
Jazz Creek	1,144	3,200	30	126	100	70	164	17	90
Jazz Creek	1,475	3,400	30	120	100	70	164	17	90
Jazz Creek	1,259	3,600	20	114	100	80	185	17	91

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Jazz Creek	908	3,600	20	114	100	80	185	17	91
Jazz Creek	1,452	3,800	20	108	100	80	185	17	91
Jazz Creek	1,863	4,000	20	101	100	80	185	17	91
Joy Creek	3,168	4,000	60	101	100	40	101	17	83
Joy Creek	2,471	4,200	60	95	95	35	101	28	72
Joy Creek	2,644	4,400	60	89	89	29	101	40	60
Knute Creek	1,063	2,800	75	139	100	25	70	17	76
Knute Creek	1,190	3,000	10	132	100	90	206	17	92
Knute Creek	897	3,200	10	126	100	90	206	17	92
Knute Creek	671	3,400	30	120	100	70	164	17	90
Knute Creek	919	3,600	30	114	100	70	164	17	90
Knute Creek	4,645	3,800	20	108	100	80	185	17	91
Knute Creek	2,711	4,000	20	101	100	80	185	17	91
Knute Creek	1,965	4,000	20	101	100	80	185	17	91
Knute Creek	1,222	4,200	20	95	95	75	185	28	85
Knute Creek	1,966	4,200	20	95	95	75	185	28	85
L. Orogrande Creek	890	2,200	60	157	100	40	111	18	84
L. Orogrande Creek	3,191	2,200	20	157	100	80	204	18	91
L. Orogrande Creek	693	2,200	20	157	100	80	204	18	91

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
L. Orogrande Creek	4,109	2,400	20	151	100	80	204	18	91
L. Orogrande Creek	648	2,400	20	151	100	80	204	18	91
L. Orogrande Creek	2,914	2,400	20	151	100	80	204	18	91
L. Orogrande Creek	1,366	2,400	60	151	100	40	111	18	84
L. Orogrande Creek	2,236	2,400	20	151	100	80	204	18	91
L. Orogrande Creek	447	2,400	60	151	100	40	111	18	84
L. Orogrande Creek	6,748	2,600	20	145	100	80	204	18	91
L. Orogrande Creek	847	2,600	60	145	100	40	111	18	84
L. Orogrande Creek	792	2,600	30	145	100	70	181	18	90
L. Orogrande Creek	546	2,600	60	145	100	40	111	18	84
L. Orogrande Creek	2,101	2,800	20	139	100	80	204	18	91
L. Orogrande Creek	2,225	2,800	20	139	100	80	204	18	91
L. Orogrande Creek	495	2,800	20	139	100	80	204	18	91
L. Orogrande Creek	413	2,800	60	139	100	40	111	18	84
L. Orogrande Creek	963	2,800	20	139	100	80	204	18	91
L. Orogrande Creek	492	2,800	30	139	100	70	181	18	90
L. Orogrande Creek	455	2,800	60	139	100	40	111	18	84
L. Orogrande Creek	918	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	4,056	3,000	10	132	100	90	227	18	92

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
L. Orogrande Creek	374	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	2,996	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	555	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	3,015	3,000	20	132	100	80	204	18	91
L. Orogrande Creek	250	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	5,110	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	10,082	3,000	20	132	100	80	204	18	91
L. Orogrande Creek	6,173	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	6,530	3,000	20	132	100	80	204	18	91
L. Orogrande Creek	351	3,000	60	132	100	40	111	18	84
L. Orogrande Creek	4,099	3,000	10	132	100	90	227	18	92
L. Orogrande Creek	1,952	3,000	60	132	100	40	111	18	84
L. Orogrande Creek	1,072	3,000	60	132	100	40	111	18	84
L. Orogrande Creek	1,252	3,000	30	132	100	70	181	18	90
L. Orogrande Creek	515	3,000	30	132	100	70	181	18	90
L. Orogrande Creek	485	3,000	60	132	100	40	111	18	84
L. Orogrande Creek	1,341	3,200	20	126	100	80	204	18	91
L. Orogrande Creek	419	3,200	60	126	100	40	111	18	84
L. Orogrande Creek	2,133	3,200	90	126	100	10	41	18	56

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
L. Orogrande Creek	2,022	3,200	45	126	100	55	146	18	88
L. Orogrande Creek	1,240	3,200	75	126	100	25	76	18	76
L. Orogrande Creek	1,493	3,200	30	126	100	70	181	18	90
L. Orogrande Creek	963	3,200	30	126	100	70	181	18	90
L. Orogrande Creek	668	3,200	60	126	100	40	111	18	84
L. Orogrande Creek	1,212	3,200	45	126	100	55	146	18	88
L. Orogrande Creek	4,498	3,200	20	126	100	80	204	18	91
L. Orogrande Creek	919	3,400	75	120	100	25	76	18	76
L. Orogrande Creek	639	3,400	60	120	100	40	111	18	84
L. Orogrande Creek	1,360	3,400	90	120	100	10	41	18	56
L. Orogrande Creek	1,090	3,400	45	120	100	55	146	18	88
L. Orogrande Creek	596	3,400	75	120	100	25	76	18	76
L. Orogrande Creek	1,800	3,400	45	120	100	55	146	18	88
L. Orogrande Creek	518	3,400	30	120	100	70	181	18	90
L. Orogrande Creek	228	3,400	60	120	100	40	111	18	84
L. Orogrande Creek	847	3,400	45	120	100	55	146	18	88
L. Orogrande Creek	1,060	3,600	60	114	100	40	111	18	84
L. Orogrande Creek	557	3,600	45	114	100	55	146	18	88
L. Orogrande Creek	1,357	3,600	45	114	100	55	146	18	88

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
L. Orogrande Creek	568	3,600	30	114	100	70	181	18	90
L. Orogrande Creek	1,450	3,600	50	114	100	50	134	18	87
L. Orogrande Creek	675	3,800	60	108	100	40	111	18	84
L. Orogrande Creek	589	3,800	50	108	100	50	134	18	87
L. Orogrande Creek	598	3,800	30	108	100	70	181	18	90
L. Orogrande Creek	317	4,000	30	101	100	70	181	18	90
Mill Creek	1,169	2,600	30	145	100	70	197	18	91
Mill Creek	1,220	2,800	30	139	100	70	197	18	91
Mill Creek	1,287	3,200	30	126	100	70	197	18	91
Pine Creek	2,003	2,800	45	139	100	55	159	18	89
Pine Creek	2,979	2,800	20	139	100	80	223	18	92
Pine Creek	1,733	3,000	45	132	100	55	159	18	89
Pine Creek	947	3,000	30	132	100	70	197	18	91
Pine Creek	154	3,000	30	132	100	70	197	18	91
Pine Creek	1,960	3,000	30	132	100	70	197	18	91
Pine Creek	1,874	3,000	30	132	100	70	197	18	91
Pine Creek	1,652	3,200	30	126	100	70	197	18	91
Pine Creek	662	3,200	30	126	100	70	197	18	91
Pine Creek	998	3,200	30	126	100	70	197	18	91

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Pine Creek	1,709	3,200	30	126	100	70	197	18	91
Pine Creek	1,309	3,400	30	120	100	70	197	18	91
Pine Creek	1,665	3,400	60	120	100	40	120	18	85
Pine Creek	2,212	3,600	60	114	100	40	120	18	85
S.F. Breakfast Creek	1,130	3,800	60	108	100	40	111	18	84
S.F. Breakfast Creek	1,412	3,800	60	108	100	40	111	18	84
S.F. Breakfast Creek	6,047	3,800	60	108	100	40	111	18	84
S.F. Breakfast Creek	3,055	4,000	20	101	100	80	204	18	91
Shake Creek	1,617	3,000	20	132	100	80	185	17	91
Shake Creek	1,551	3,200	20	126	100	80	185	17	91
Shake Creek	897	3,400	30	120	100	70	164	17	90
Shake Creek	2,241	3,400	20	120	100	80	185	17	91
Shake Creek	1,722	3,600	30	114	100	70	164	17	90
Shake Creek	3,041	3,600	30	114	100	70	164	17	90
Shake Creek	3,439	3,600	30	114	100	70	164	17	90
Shake Creek	1,991	3,800	30	108	100	70	164	17	90
Silver Creek	4,348	3,400	75	120	100	25	70	17	76
Silver Creek	10,656	3,600	50	114	100	50	122	17	86
Silver Creek	6,952	3,800	55	108	100	45	112	17	85

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Sylvan Creek	507	3,600	60	114	100	40	111	18	84
Sylvan Creek	2,688	3,600	30	114	100	70	181	18	90
Sylvan Creek	3,063	3,600	30	114	100	70	181	18	90
Sylvan Creek	1,996	3,800	60	108	100	40	111	18	84
Sylvan Creek	1,672	3,800	60	108	100	40	111	18	84
Sylvan Creek	4,230	3,800	30	108	100	70	181	18	90
Sylvan Creek	1,122	3,800	60	108	100	40	111	18	84
Sylvan Creek	3,900	4,000	60	101	100	40	111	18	84
Sylvan Creek	1,386	4,000	60	101	100	40	111	18	84
Sylvan Creek	1,478	4,000	30	101	100	70	181	18	90
Sylvan Creek	1,101	4,000	45	101	100	55	146	18	88
Sylvan Creek	1,568	4,000	60	101	100	40	111	18	84
Sylvan Creek	1,960	4,200	60	95	95	35	111	29	74
Sylvan Creek	4,374	4,200	50	95	95	45	134	29	78
Sylvan Creek	1,742	4,200	30	95	95	65	181	29	84
Sylvan Creek	2,196	4,200	45	95	95	50	146	29	80
Sylvan Creek	1,089	4,200	60	95	95	35	111	29	74
Sylvan Creek	665	4,200	60	95	95	35	111	29	74
Sylvan Creek	2,445	4,400	60	89	89	29	111	43	61

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Sylvan Creek	1,025	4,400	60	89	89	29	111	43	61
Sylvan Creek	1,177	4,400	45	89	89	44	146	43	71
Sylvan Creek	1,743	4,400	60	89	89	29	111	43	61
Sylvan Creek	1,648	4,600	60	83	83	23	111	57	49
Tamarack Creek	2,001	3,000	60	132	100	40	101	17	83
Tamarack Creek	2,711	3,000	60	132	100	40	101	17	83
Tamarack Creek	2,774	3,000	75	132	100	25	70	17	76
Tamarack Creek	1,969	3,200	60	126	100	40	101	17	83
Tamarack Creek	1,757	3,200	60	126	100	40	101	17	83
Tamarack Creek	2,269	3,200	75	126	100	25	70	17	76
Tamarack Creek	2,136	3,400	60	120	100	40	101	17	83
Tamarack Creek	1,208	3,400	60	120	100	40	101	17	83
Tamarack Creek	1,252	3,400	60	120	100	40	101	17	83
Tamarack Creek	2,639	3,400	60	120	100	40	101	17	83
Tamarack Creek	1,135	3,400	60	120	100	40	101	17	83
Tamarack Creek	1,059	3,400	75	120	100	25	70	17	76
Tamarack Creek	1,037	3,600	60	114	100	40	101	17	83
Tamarack Creek	1,048	3,600	60	114	100	40	101	17	83
Tamarack Creek	1,193	3,800	60	108	100	40	101	17	83

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Tamarack Creek	965	3,800	60	108	100	40	101	17	83
Tamarack Creek	2,437	3,800	60	108	100	40	101	17	83
Tamarack Creek	991	4,000	60	101	100	40	101	17	83
Tamarack Creek	857	4,000	60	101	100	40	101	17	83
Tamarack Creek	903	4,000	60	101	100	40	101	17	83
Tamarack Creek	827	4,000	60	101	100	40	101	17	83
Tamarack Creek	830	4,200	60	95	95	35	101	28	72
Tamarack Creek	1,172	4,200	60	95	95	35	101	28	72
Tamarack Creek	1,019	4,400	60	89	89	29	101	40	60
U. Orogrande Creek	1,940	3,200	60	126	100	40	111	18	84
U. Orogrande Creek	3,494	3,400	30	120	100	70	181	18	90
U. Orogrande Creek	1,839	3,400	30	120	100	70	181	18	90
U. Orogrande Creek	4,256	3,400	75	120	100	25	76	18	76
U. Orogrande Creek	1,096	3,400	60	120	100	40	111	18	84
U. Orogrande Creek	1,514	3,400	45	120	100	55	146	18	88
U. Orogrande Creek	1,853	3,400	60	120	100	40	111	18	84
U. Orogrande Creek	1,817	3,400	75	120	100	25	76	18	76
U. Orogrande Creek	1,348	3,400	60	120	100	40	111	18	84
U. Orogrande Creek	94	3,600	75	114	100	25	76	18	76

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
U. Orogrande Creek	1,033	3,600	75	114	100	25	76	18	76
U. Orogrande Creek	2,224	3,600	60	114	100	40	111	18	84
U. Orogrande Creek	2,153	3,600	55	114	100	45	122	18	85
U. Orogrande Creek	2,746	3,800	75	108	100	25	76	18	76
U. Orogrande Creek	866	3,800	75	108	100	25	76	18	76
U. Orogrande Creek	3,918	3,800	65	108	100	35	99	18	82
U. Orogrande Creek	3,474	4,000	35	101	100	65	169	18	89
U. Orogrande Creek	3,407	4,000	80	101	100	20	64	18	72
W.F. Elk Creek	9,081	3,800	50	108	100	50	122	17	86
W.F. Elk Creek	5,231	3,600	30	114	100	70	164	17	90

¹More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split because of a radical percent canopy closure change, or a reach is split at the confluence of two tributaries (see map). The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.

²Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.

³CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.

Appendix 5. Osier Creek Watershed Temperature TMDLs (includes Swamp Creek, China Creek, Sugar Creek, and Laundry Creek)

An ArcView shapefile of these data is on the diskette located in the back of this document

Appendix 5. Osier Creek Watershed Temperature TMDLs (includes Swamp Creek, China Creek, Sugar Creek and Laundry Creek)

This appendix, along with ArcView shapefile data included on the enclosed diskette, constitutes the temperature TMDLs for Osier Creek, Swamp Creek, China Creek, Sugar Creek, and Laundry Creek. Figure 5-1 shows the distribution of stream segments needing increased percent canopy closure to meet the TMDLs targets. Table 5-1 presents the loading calculations data on a stream reach by stream reach basis. The location of each stream reach can be ascertained using the ArcView shapefile. The ArcView shapefile contains all the data used to create the percent canopy closure increase targets in Figure 5-1 and the data presented in Table 5-1.

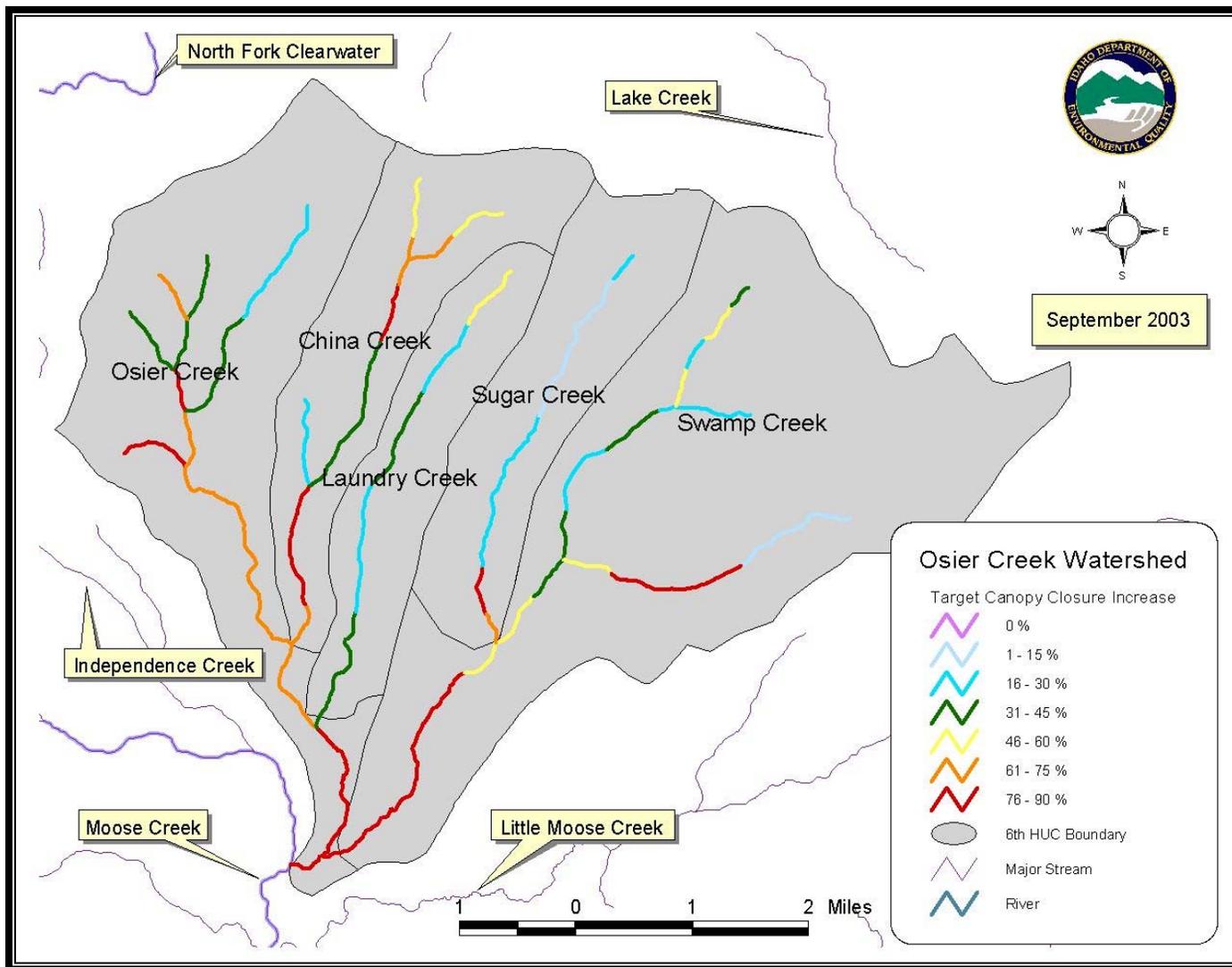


Figure 5-1. Targeted Percent Canopy Closure Increases for the Osier Creek Watershed

Table 5-1. Osier Creek watershed temperature TMDLs, stream reach by stream reach (includes TMDLs for Swamp Creek, China Creek, Sugar Creek, and Laundry Creek).

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
China Creek	2,130	3,600	30	114	100	70	164	17	90
China Creek	1,526	3,600	15	114	100	85	196	17	91
China Creek	4,230	3,800	15	108	100	85	196	17	91
China Creek	4,149	4,000	75	101	100	25	70	17	76
China Creek	7,741	4,000	60	101	100	40	101	17	83
China Creek	2,666	4,200	15	95	95	80	196	28	86
China Creek	1,263	4,200	30	95	95	65	164	28	83
China Creek	1,085	4,200	30	95	95	65	164	28	83
China Creek	2,466	4,200	30	95	95	65	164	28	83
China Creek	2,745	4,400	30	89	89	59	164	40	76
China Creek	2,659	4,400	30	89	89	59	164	40	76
Laundry Creek	3,512	3,600	60	114	100	40	101	17	83
Laundry Creek	2,618	3,800	60	108	100	40	101	17	83
Laundry Creek	3,141	3,800	75	108	100	25	70	17	76
Laundry Creek	2,851	4,000	75	101	100	25	70	17	76
Laundry Creek	2,221	4,000	60	101	100	40	101	17	83
Laundry Creek	2,707	4,200	60	95	95	35	101	28	72

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Laundry Creek	3,740	4,400	60	89	89	29	101	40	60
Laundry Creek	2,199	4,600	30	83	83	53	164	53	68
Laundry Creek	1,059	4,800	30	77	77	47	164	65	60
Osier Creek	1,806	3,200	15	126	100	85	196	17	91
Osier Creek	4,628	3,200	15	126	100	85	196	17	91
Osier Creek	4,624	3,400	30	120	100	70	164	17	90
Osier Creek	2,488	3,400	15	120	100	85	196	17	91
Osier Creek	5,180	3,600	30	114	100	70	164	17	90
Osier Creek	4,141	3,800	30	108	100	70	164	17	90
Osier Creek	2,715	3,800	30	108	100	70	164	17	90
Osier Creek	1,768	3,800	30	108	100	70	164	17	90
Osier Creek	5,524	4,000	60	101	100	40	101	17	83
Osier Creek	6,076	4,200	75	95	95	20	70	28	60
Pioneer Gulch	3,449	4,000	15	101	100	85	196	17	91
Pollock Creek	2,370	3,800	45	108	100	55	146	18	88
Pollock Creek	4,470	4,000	15	101	100	85	216	18	92
Pollock Creek	1,882	4,200	15	95	95	80	216	29	87
Pollock Creek	2,528	4,400	75	89	89	14	76	43	43
Pollock Creek	2,329	4,600	75	83	83	8	76	57	25

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Pollock Creek	1,078	4,800	75	77	77	2	76	71	7
Sugar Creek	1,453	3,600	30	114	100	70	164	17	90
Sugar Creek	1,313	3,800	75	108	100	25	70	17	76
Sugar Creek	2,217	3,800	15	108	100	85	196	17	91
Sugar Creek	2,119	4,000	75	101	100	25	70	17	76
Sugar Creek	842	4,000	75	101	100	25	70	17	76
Sugar Creek	3,550	4,200	75	95	95	20	70	28	60
Sugar Creek	4,031	4,400	75	89	89	14	70	40	43
Sugar Creek	3,411	4,600	75	83	83	8	70	53	24
Sugar Creek	1,414	4,800	50	77	77	27	122	65	47
Swamp Creek	2,385	3,200	15	126	100	85	216	18	92
Swamp Creek	7,814	3,400	15	120	100	85	216	18	92
Swamp Creek	1,687	3,600	15	114	100	85	216	18	92
Swamp Creek	2,267	3,600	45	114	100	55	146	18	88
Swamp Creek	2,856	3,600	45	114	100	55	146	18	88
Swamp Creek	2,200	3,800	60	108	100	40	111	18	84
Swamp Creek	2,351	3,800	60	108	100	40	111	18	84
Swamp Creek	3,678	4,000	75	101	100	25	76	18	76
Swamp Creek	3,073	4,200	60	95	95	35	111	29	74

Stream Name	Stream Segment Length	Elevation ¹	Current Canopy Closure ²	CWE Modeled Canopy Closure ³	Target Canopy Closure	Target Canopy Closure Increase	Current Insolation Heat Load	Target Insolation Heat Load	Target Insolation Heat Load Reduction
	(feet)	(feet)	(%)	(%)	(%)	(%)	(watts/m ²)	(watts/m ²)	(%)
Swamp Creek	757	4,400	60	89	89	29	111	43	61
Swamp Creek	1,692	4,400	60	89	89	29	111	43	61
Swamp Creek	1,832	4,400	30	89	89	59	181	43	76
Swamp Creek	1,470	4,600	60	83	83	23	111	57	49
Swamp Creek	1,888	4,800	60	77	77	17	111	71	36
Swamp Creek	2,125	4,800	30	77	77	47	181	71	61
Swamp Creek	1,173	5,000	30	71	71	41	181	85	53
WF Osier Creek	2,442	4,000	60	101	100	40	101	17	83
WF Osier Creek	3,459	4,000	60	101	100	40	101	17	83
WF Osier Creek	2,014	4,000	15	101	100	85	196	17	91
WF Osier Creek	3,105	4,200	60	95	95	35	101	28	72
WF Osier Creek	2,455	4,200	30	95	95	65	164	28	83

¹More than one segment of a named water body may occur in the same 200-foot elevation zone. Generally this is because unnamed perennial tributaries are included in the analysis, a reach is split at the confluence of two tributaries (see map), or a reach is split because of a radical percent canopy closure change. The only way to know which data apply to which reach on the ground is to use the ArcView data set included with this report.

²Current Canopy Closure (%) is estimated from recent 1:15,840 stereo aerial photographs.

³CWE Modeled Canopy Closure (%) is the percent canopy closure predicted by the CWE temperature model as needed to protect stream temperatures for salmonid spawning and/or bull trout.